COAL AGE

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What in the World Can You Expect

By Rufus T. Strohm

You raise your voice in a doleful wail,
You clench your fists and you beat your breast,
Because expenses absorb your kale
And knock your bank-roll galley-west.
You curse the way that the prices rise,
With every ounce of your intellect,
And damn the Government to the skies—
Say, what in the world can you expect?

When all the millions of Union men
Reduce the length of the working day,
And boost their wages by half again,
Yet toil along in the slow old way;
When men lose faith in their brotherhood,
And each one feels that he must collect
The most he can while the getting's good—
Well, what in the world can you expect?

When herds of foreigners sprag the wheels
That fill the shelves of the Nation's store,
But keep on eating their three square meals
Without a thought of producing more;
When Labor's pledges are paper scraps,
And Trust and Confidence both lie wrecked,
And Honor shares in the grand collapse—
Well, what in the world can you expect?

When Ease and Pleasure become the gods,
And Thrift is sent as a sacrifice;
When men keep saying, "Oh, what's the odds?
I've got to have it—so hang the price!"
When love of luxury rules the land
And gross extravagance goes unchecked,
And simple laziness stays the hand—
Well, what in the world can you expect?

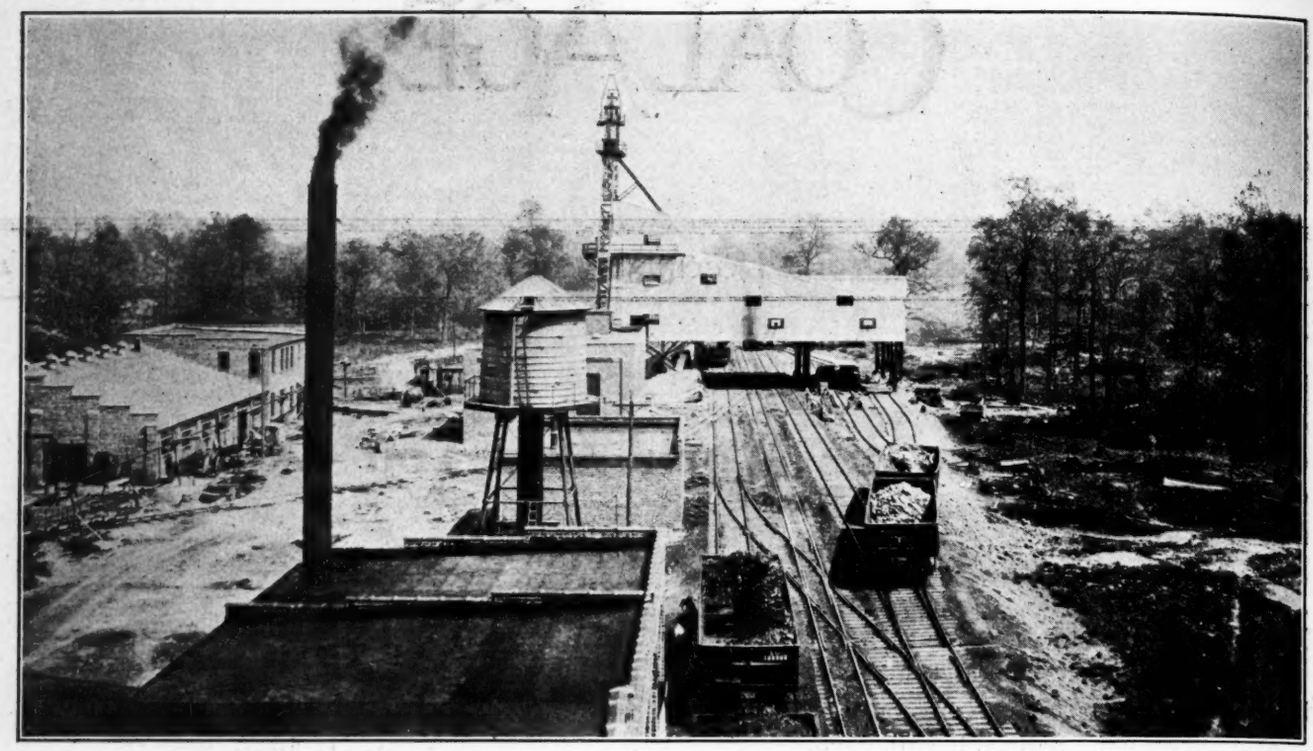


FIG. 4. VIEW FROM AIR SHAFT AT THE KATHLEEN MINE

Engineering Features of Modern Large Coal Mines in Illinois and Indiana*—II.

By C. A. Herbert† and C. M. Young‡
Vincennes, Ind. Urbana, Ill.

Although many new mines have been developed in Southern Illinois and many improvements made in the recent past, six large new operations have been selected as showing the trend of modern coal-mine and engineering practice. The details of these developments are here compared.

THE construction of the tipples of the six mines considered in this paper shows only one striking novelty—the concrete air-shaft tipple of the Katheleen mine. The use of concrete for the construction of tipples is not in itself a novelty, as it has been employed in some other districts. In this case concrete was adopted, not because a concrete structure was desired, but because at the time of designing it was doubtful whether steel could be obtained. In spite of the fact that a portion of the concrete was poured when the thermometer registered about 20 deg. below zero, the work is sound and the structure is peculiarly attractive. Moreover, it is perfectly rigid, no vibration whatever being felt when the hoist is running. The cost of the concrete tipple, as built, was about $6000 higher than that of the steel tipple originally intended. A considerable part of this excess was due to the expense of heating the materials and of pouring the concrete during severely cold weather. At this mine and at the Valier, cars hoisted at the air shaft will be dumped in Wood single-car rotary dumps.

Attention may also be drawn to the fact that of the mines mentioned, four have tipples of the three-leg type introduced by Allen & Garcia. Two of these have bar screens, and the others shaking screens. The tipple at the Bell & Zoller No. 2 was designed and built by the Wisconsin Bridge and Iron Co. The tipple at the Standard No. 2 mine was designed by R. W. Hunt & Co. The equipment for preparation at the six mines considered is designed to satisfy the needs of the different producers and may be enumerated as follows:

Standard No. 2.—At the Standard No. 2 mine all coal is to be crushed to from 1¼ to 1½ in. and the only screening equipment needed is that preceeding the crusher for bypassing the small coal. The coal will go from the skips to a receiving bin from which it will pass over two parallel conveying and crushing equipments, each designed to handle 500 tons per hour. The coal passes from the receiving bin to two 54-in. feeder conveyors, from which it goes over sloping bar screens, the oversize going to crushers from which it drops to conveyors, being joined there by the undersize of the screens. Two 60-in. apron conveyors elevate the coal to the middle of the line of loading bins, which are built in two lines over the two loading tracks and extend for a linear distance of 360 ft. Their capacity is 3500 tons. Each apron conveyor discharges onto a 72-in. flat-top

*Part of a paper presented before the Chicago meeting of the American Institute of Mining Engineers, September, 1919.
†Mining engineer, U. S. Bureau of Mines.
‡Professor of Mining Engineering, University of Kansas.

conveyor, one running from the middle to each end of the line of bins. Adjustable scrapers are used to distribute the crushed coal into the bins, from which it will be discharged into cars.

Superior No. 5.—In point of simplicity of preparation equipment, the Superior No. 4 comes next. The preparation depends on the kind of coal demanded. When fuel is being stored, all coal over 2 in. or over 6 in. goes to storage. The material under 6 in. may be shipped as mine run. The material under 2 in. goes to the washer. When coal is not being stored, it may be crushed to pass a 6-in. screen. The screening equipment is designed to meet this simple demand and consists only of gravity bar screens. Material to be crushed is carried by a reciprocating feeder to the crusher.

Valier.—At the Valier mine shaker screens with pendulum suspension are used. These are so arranged as to make four sizes of coal: lump, egg, 2½-in. screenings and a fine coal approximately corresponding to No. 5. The two larger sizes are run over picking tables and may either be loaded into cars or fed to a crusher and reduced to pass through a 2½-in. screen. The plant is thus equipped to furnish coal for either hand-fired locomotives or those equipped with mechanical stokers.

American No. 2.—As the coal from this mine will be sold almost entirely to steam trade, the screening equipment is similar to that of the Superior No. 4. The coal will be run over bar screens so arranged as to make either 1¼-in. screenings and standard lump, 1¼-in. screenings and railroad lump, mine run, or the entire output may be run through crushers and made into 1½-in. screenings. Picking tables are being installed for both the mine run and lump coal.

Kathleen.—At this mine the demand will be variable, as part of the coal will go to the St. Louis and Milwaukee plants of the North American Co., which consume 500,000 tons of screenings per year. The remainder is to be marketed and the tipple is equipped for making lump, 3 x 6-in. egg, 2 x 3-in. nut and 2-in. screenings. There are picking tables for the nut, egg and lump coal, with loading booms for lowering the coal into the cars. Provision has also been made for the installation of crushers so that either the lump or the egg coal may be crushed to screenings if the market conditions make this desirable. Shaker screens are used with pendulum suspension. At this mine and at Valier, the crushers are so placed that the coal may be discharged into them by elevating the loading boom.

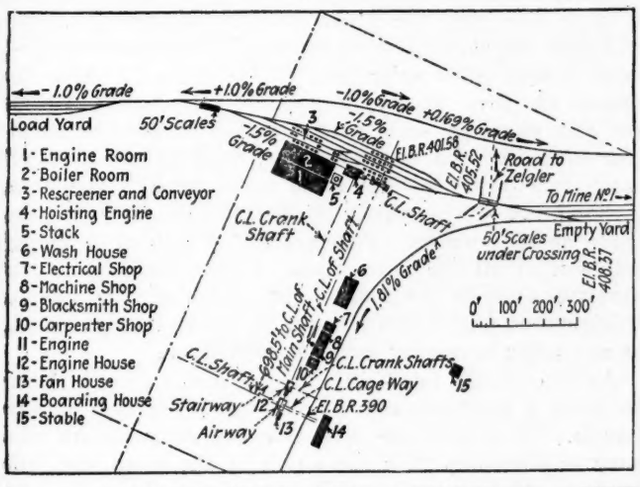


FIG. 5. SURFACE LAYOUT, BELL & ZOLLER NO. 2 MINE

Bell & Zoller No. 2.—The preparation equipment at this mine is more elaborate than that at any of the others. The main screen will produce three sizes of coal; lump, 6-in. egg and 3-in. screenings. The egg and lump sizes from the main screen will be passed over picking tables and discharged over loading booms. Provision is also made for the installation of crushers to reduce either the lump or egg sizes. Means are also provided for loading lump coal into box cars on a separate track, in case these should be available when coal cars are not. The screenings will be elevated by a belt conveyor to a screening plant equipped with two sets of screens in parallel, supported on ash boards, which will produce coal of the five standard Illinois sizes: Nos. 1, 2, 3, 4 and 5. The screens are of such length as to permit hand picking if this should be necessary. The rescreening plant is set over the loading tracks and the coal will be discharged from the screens to the bins, from which it will be loaded. The chutes

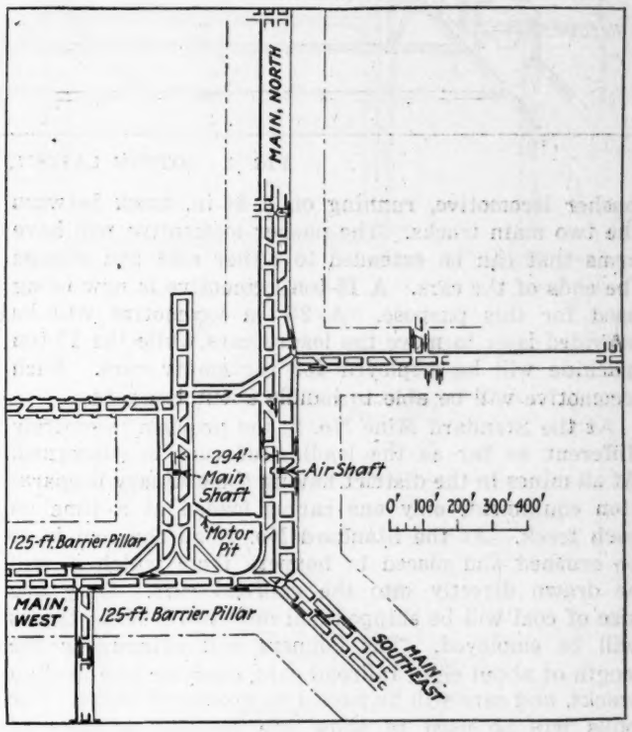


FIG. 6. PLAN OF SHAFT BOTTOM AT AMERICAN NO. 2 MINE

from these bins are equipped with lip screens for removing the fines produced by handling.

U. S. Fuel Co.—The U. S. Fuel Co., a subsidiary of the United States Steel Corporation, is developing a coal property lying to the northeast of Benton, Franklin County, Illinois. All the coal produced is to be washed, so a large concrete washer has been erected and equipped with jigs, tables and settling tanks. This is by far the largest washer in the central coal field and its equipment has been planned with great care. The company is not yet ready for a discussion of its operation.

The system of handling cars on the surface by gravity, common in this district, has been followed at most of the mines. This system sometimes requires extensive grading in a level country and the moving of cars is difficult in winter. The surface layout for the Bell & Zoller No. 2 mine is shown in Fig. 5.

At the Kathleen mine, the nature of the surface is such that the construction of a gravity yard would have required an unusual amount of grading, as the surface at the mine is practically on a level with the main line of the Illinois Central from which the cars will be taken. This difficulty has been avoided by the use of a flat yard, the only grade being that extending from the air shaft on the west, past the main shaft and railroad scales on the east, where there is sufficient grade for the movement of the cars being loaded. Over the remainder of the yard, cars will be moved by a pusher locomotive, running on a 36-in. track between the two main tracks. The pusher locomotive will have arms that can be extended to either side and engage the ends of the cars. A 15-ton locomotive is now being used for this purpose. A 25-ton locomotive will be provided later to move the loaded cars while the 15-ton machine will be employed for the empty cars. Each locomotive will be able to handle about ten cars.

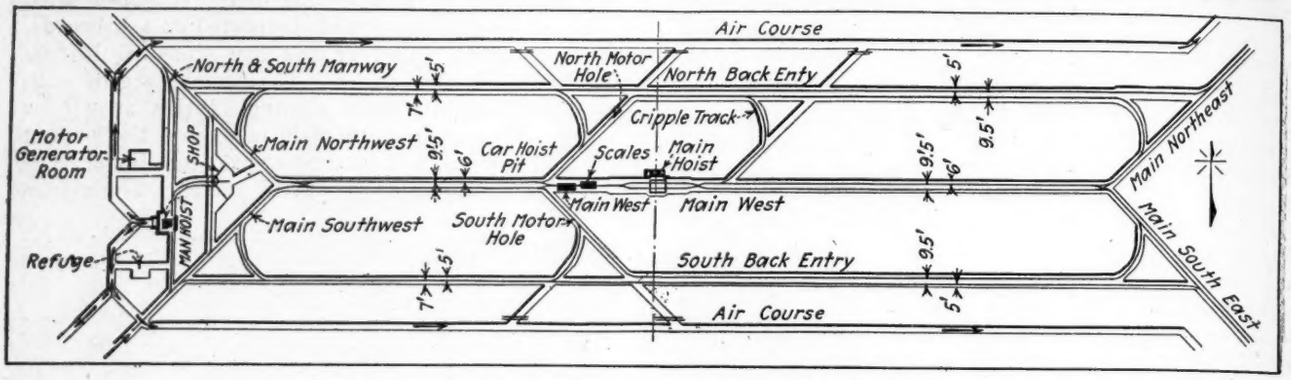


FIG. 7. BOTTOM LAYOUT, STANDARD OIL CO. SHAFT

At the Standard Mine No. 2, the problem is entirely different as far as the loading of cars is concerned. At all mines in the district having the ordinary preparation equipment, only one car is loaded at a time on each track. At the Standard No. 2, all the coal is to be crushed and placed in hoppers from which it will be drawn directly into the railroad cars. Only one size of coal will be shipped and only two loading tracks will be employed. The hoppers will extend for the length of about eight railroad cars, over the two loading tracks, and cars will be loaded in groups of eight. Car pulls will be used to allow the spotting of cars of variable lengths under the loading chutes. Under these circumstances the simplest arrangement is to employ a switching engine. The track layout differs from that of the ordinary mine in that there is no provision for the collection of loaded cars beyond the tipple. The empty cars will be brought in from the west to the loading hoppers and after being loaded will be taken back toward the west to be made up into trains.

At three of the mines, Superior No. 4, Standard No. 2 and Bell & Zoller No. 2, power plants have been erected. The Superior No. 4 will be equipped with five vertical water-tube boilers of 513 hp., which will supply steam at 150 lb. pressure and 150 deg. of superheat. There are two turbo-generators, one having a capacity of 938 kv.-a. and one of 375 kv.-a., both generating current at 2300 volts. All steam piping from the boilers to the engine is in duplicate, so that any interruption of service in the steam lines is guarded against.

At the Standard No. 2, a central power plant is being erected at which four 750-hp. Vogt boilers have been installed. These are expected to produce from 1000-1200 hp. each, and it is probable that two more boilers will be added in the future. The power plant contains two 2500-kw. turbo-generators, and one 1250-kw. generator, all supplying current at 2200 volts. The surplus power will be transmitted to other plants. One of the precautions against interrupted transmission from this plant to the mine is the construction of a double transmission line from the power plant to the main shaft.

The three other mines are supplied by power purchased from public-service corporations. The American No. 2 can, in case of protracted failure of the power supply, be furnished by the power plant of the No. 1 mine, which can be enlarged sufficiently to supply both mines.

In the case of the Kathleen mine, it would be possible within 90 days to build a power line from one of the generating stations of the Union Electric Light and Power Co., at St. Louis.

During the past 25 years, the method of mining in the central field has been changed from the old room-and-pillar system with long room entries, which in many instances were used as main haulage roads, to what is known as the panel system. In this latter system, no rooms are turned from the haulage and main air-course entries, but these are protected on either side by large barrier pillars. The room entries turned off from these main entries are comparatively short, averaging from 1000 to 1500 ft. in length. In the typical panel system of mining, each panel, consisting of two room entries with their respective rooms, is a unit in itself connected with the other workings only where the two-room entries pierce the barrier pillar.

This method of mining has come into general use in the central field, principally, because of the prevalence of mine fires and the great difficulty of sealing them off under the old system of mining, it then being necessary to seal off a large part of the mine in order to control the fire. It is now possible to isolate a fire in any one panel by seals at the points where the room entries pierce the barrier pillar, without the loss of much territory. At the same time, because the area is small, the fire is usually smothered completely within three or four weeks. This system of mining is being followed at all the new mines in this field with such variations as to the length and width of the rooms, thickness of pillars and number of rooms in each panel, as are made necessary by local conditions.

At the Valier mine an attempt will be made later to make a complete recovery of the pillar coal in the panels. With this one exception the room pillars will vary in thickness with the depth of the seam and will be only thick enough to allow rooms to be driven to

full length without squeezing. The barrier pillars are of sufficient thickness to protect the main entry from any subsequent squeezing. The dimensions of rooms and relative dimensions of rooms and pillars are, however, subject to change and it is not improbable that steps will ultimately be taken for the recovery of pillar coal at some of the mines, if not at all.

At the Valier mine it is planned that the rooms shall be 25 ft. wide on 85-ft. centers, leaving 60-ft. room pillars, which will be later recovered. By driving the cross-cuts between the rooms 20 ft. in width, 40 per cent. of the coal will be taken out in the advance. This is nearly as much as the total extraction at the other mines in this field. The room pillars will be left in blocks 60 ft. square, which may be recovered later without the squeezing that would be certain to take place should an attempt be made to recover the narrow room pillars employed at the other mines. The ultimate extraction is expected to be about 70 per cent.

The sinking of these new mines with large daily capacities and intended to work out larger areas than ever were contemplated in the past, has led to the necessity for driving a greater number of main airways. Until recently two entries in the mines in this field had been thought sufficient.

At the Bell & Zoller No. 2 it is proposed to use the four-entry system throughout the mine for all of the main haulage and airways, with double entries in the panels. At the Valier and at the Superior No. 4, four main entries will be driven, the cross-entries, or secondary mains, from which the room entries are turned, will be on the three-entry system, with two entries in the panels. At the Kathleen mine, the three-entry system will be used for the mains, with the two-entry system for the secondary mains and panel entries. At the American mine No. 2, the three-entry system will be used for both the main and secondary main entries with two entries in the panels.

The four-entry system has the advantage of making it possible to put the required amount of air into the mine at a much lower pressure and velocity than where fewer entries are used, accompanied with a marked saving in power required to operate the fan. Also where the entries are driven in pairs with no cross-cut between the two central entries, except at points where cross or room entries are turned off, the necessity of expensive brick or concrete stoppings is eliminated, as the air in both entries of each pair travels in the same direction. Moreover, in case of an explosion the recovery work can be carried on much more rapidly and economically, as there will be no delay nor expense in rebuilding stoppings to restore ventilation.

The shortwall mining machine has practically superseded the breast machine at all these new developments. Alternating-current undercutters will be used at four of the six new larger developments in this field. In every case, it is proposed to take 2300-volt, three-phase alternating current into the mine in armored cables to motor-generator sets located at advantageous points in the workings, there to be transformed to 250-volt direct current for haulage locomotives.

At the American mine No. 1, where 240-volt alternating current mining machines have been in use for several years, the mining machine transformers are supplied with 240-volt and 275-volt secondary taps, so that when the room entries have advanced sufficiently to make a drop in voltage noticeable at the machines the machine lines are connected to the 275-volt taps. This same system will be used in the No. 2 mine.

With the advent of the 5-ton mine car, it has been found that the 6-ton gathering locomotive, which had been almost a standard in this field, is too light and the gathering locomotives at these mines will weigh from 7.5 to 8 tons. At the Valier mine and at the Standard No. 2, combined storage-battery and trolley gathering locomotives will be used, while at the other mines the trolley-and-reel type of gathering locomotives will be employed.

The use of heavier cars and locomotives has also made it necessary to use heavier track with curves of longer radius. In fact, the underground mine tracks in these new mines will closely approximate, as far

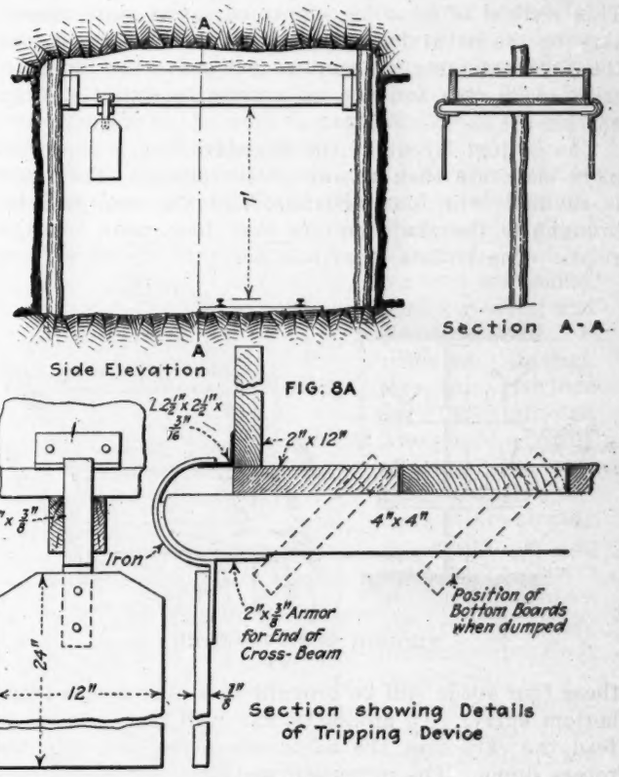


FIG. 8. DETAILS OF THE JONES DUST BARRIER

as the class of construction is concerned, the standards of the modern steam or electric railway.

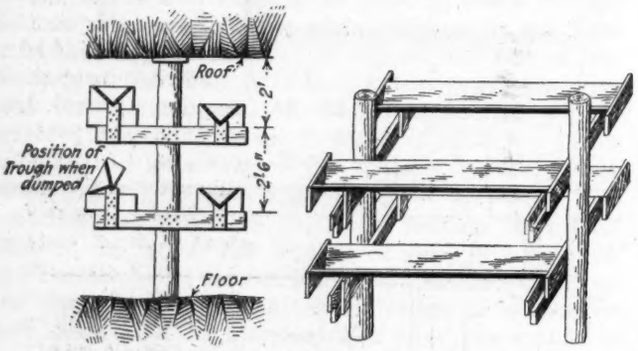
The bottom layout at the American No. 2, shown in Fig. 6., Bell & Zoller No. 2 and Superior No. 4 are all much alike. At each of these mines self-dumping cages are used. At each what is known as the A-type of bottom has been adopted, in which the coal is brought in from either side of the mine to a double-track shaft-bottom entry, at right angles to the main entry.

The mine car, after being automatically fed onto the cage, hoisted, and dumped is returned to the bottom, where it is pushed off the cage by the oncoming loaded car. After leaving the cage, the cars pass by gravity to a kickback switch and are shunted off to either side into entries forming the sides of the A, where they are made up into empty trips to be taken back inside. Where the natural conditions make it necessary, a car haul is put in between the cage and the kickback switch in order to give sufficient grade to run the cars back into the empty-car storage entries.

There are usually a number of cut-throughs between the main bottom and the entries on either side to enable the locomotive coming in with the loaded trip to uncouple at a convenient point and run through to the waiting trip of empty cars.

The bottom layout at both the Kathleen and Valier mines is quite similar to that just described except that the cars are run in over a single track to be weighed and dumped and that provision has been made to handle the empty cars in trips instead of singly, as will be done where cages are employed. At the Valier mine, the cars will be handled in trips of ten. After leaving the dump, these trips will run a short distance to the foot of a rather steep incline up which they will be hoisted by a single-drum electric hoist. From the top of this incline, the trips will be shunted off to the entries on either side of the main shaft bottom. This method of handling empty cars was made necessary by the natural grades that were encountered. At the Kathleen mine the empties will leave the dump in trips of 20 cars and run by gravity to empty storage entries.

The bottom layout at the Standard No. 2 is rather more elaborate than at any of the others. The mine is divided into four districts, and the coal will be brought to the shaft bottom over four main haulage roads. The bottom is so laid out that the cars from



TROUGH DUST BARRIER

these four roads will be brought to a long double-track bottom entry. An automatic car haul will be used to feed the cars over the automatic scales and into the rotary dump. The movement and dumping of the cars will be controlled by one man. At this mine, contrary to the general custom, the cars will be turned end for end at each trip to the bottom; a new and ingenious coupling has been provided for each end.

At the Valier mine, entry-driving machines have been introduced to accomplish rapid development work, promote safety through elimination of explosives and prevent the shattering action of explosives on the ribs and roof of the entry. Two B-34 machines, made by the Jeffrey Manufacturing Co., have been used. The cutting in this mine is unusually hard, but under ordinary conditions an advance of as much as 150 ft. per week was made with each machine, by working three shifts. On single shifts these machines are now making a general average of 300 ft. per month. With regard to the economy of the use of these machines, it is the opinion of Carl Scholz, general manager of the company, that the cost of installation and operation will be repaid many times by the saving in timbering because the coal is not affected by the use of explosives when these machines are employed. The roof will stand much better than it does when so shattered and timbering will be unnecessary in most parts of the entries. These machines are being used on the main west entries where a possible distance of 3½ miles can be driven. After an experience of about one year in entry driving in this mine, a difference between the standing qualities of these entries and those driven with explosives can be observed.

The Old Ben Coal Corporation has undertaken a more elaborate program for accident prevention than is being followed by any other coal company in this district. This program follows three lines. In the first place it was decided that only electric safety lamps should be allowed in the future in the No. 11 mine in which an explosion had occurred, and that no one should be allowed to smoke in the mine or even carry matches. At first this ruling met with some opposition but at the present time this has entirely disappeared and the mine is being satisfactorily operated with electric lamps.

In the second place, a safety engineer was employed, whose work is a general inspection of the mines of the company with special regard to the prevention of accidents, and the recommendation of changes to be made and policies to be followed. In the pursuit of this work, the safety engineer, J. E. Jones, formerly state mine inspector, is making a close study of all accidents and their causes, giving attention not only to the immediate physical causes of these accidents but to the classes of labor in which they are most common. Records are also kept covering the accident rate under different headings at the different mines of the company. In addition to this, careful study will be made of all the fatal accidents in the Franklin County field.

The third line followed is the introduction of dust barriers. The general plan promulgated by the U. S. Bureau of Mines was pursued, but the details were worked out by the company staff. These barriers are of two types; a concentrated barrier for the haulage entries and a trough barrier for the airways. The concentrater barrier is commonly known as the Jones barrier, but represents the combined efforts of the company staff.

The Jones barrier consists essentially of a box about 2 ft. deep and extending across the entry, the dimensions being varied somewhat to suit its capacity to the width of this passageway. The bottom of the box consists of a number of planks running crosswise of the entry, 10 to 12 in. wide, and notched out at the ends so that only a few inches of one edge of the planks rests on the framework of the box proper. When unsupported from underneath, the planks drop down at an angle of about 45 deg., allowing the dust to pour out in a number of thin streams. In their normal position, when loaded with dust, these bottom planks are held in position by cross-pieces, which extend beyond the box on either side and are held in place by supporting irons. The ends of the cross-piece are cut to a half circle and fit into a semi-circular curve in the iron supports. They are so adjusted that a slight outward pull on the supporting irons releases the cross-pieces and allows the bottom planks to tilt downward, discharging the rock dust.

To the bottom end of each supporting iron is attached a vane about 12 in. wide and 24 in. long. These vanes will be caught by the advancing wave of an explosion, moving the supporting irons sufficiently to allow the cross-pieces to fall. It is planned also that other vanes shall be placed at some distance from the

barrier along the entry and connected with the supporting irons, thus providing for a somewhat earlier operation of the barrier.

As the Jones barrier is up close to the roof of the entry and offers no obstruction either before or after being discharged, it is thought to be a marked improvement over the Rice barrier, which when discharged drops into the entry sufficiently to offer a dangerous obstruction to locomotives or cars, in case of accidental discharge.

The trough barrier, Fig. 9, consists of V-shaped troughs loaded with shale dust, supported on arms attached to posts set in the entry. Each pair of posts carries four troughs set at different elevations. The supporting posts are so arranged that the sets of troughs are staggered along the entry, thus providing a winding path for men to travel but protecting the entire cross-area of the entry. The troughs are made of 8-in. boards nailed together at right angles and are supported in notches 1 in. deep. With this arrangement they will be easily overturned by any strong blast of air; moreover, the shale dust is heaped up in the troughs so that a considerable amount will be blown off, even by a blast of air too feeble to overturn the troughs.

The company has installed a crusher in which shale from the mines is reduced in size so that 75 per cent. will pass a 250-mesh screen, 92 per cent. a 200-mesh screen and 95 per cent. a 150-mesh screen. The dust is removed from the crusher by a current of air and only that fine enough to be thus raised is used; 94 per cent. of this dust is ash and the remainder mostly moisture.

The proper housing of mine labor has always been a serious problem, and one that has been much neglected until recent years. This field is fortunate in that most mines are situated near established towns in which men can find homes.

There has been only one development in mine housing of sufficient importance to warrant inclusion in a discussion such as this. This is the provision of residences in connection with the work of the Standard Oil Co. of Indiana. Though the No. 2 mine is about 8 miles from Carlinville, it was decided that no town should be built at the mine, but that houses should be erected in an addition to the town of Carlinville, thus giving the miners the benefit of city schools, lights, water and sewer systems.

The houses were erected by Sears, Roebuck & Co., of Chicago. One hundred and fifty-six houses were erected in Carlinville, and twelve more at the mine for the accommodation of those employees who must necessarily be constantly at the mine. The plans and materials for these houses were taken from the regular stock of the company, illustrated in its catalog. In order to diversify the dwellings as far as possible, 14 different floor plans were used and these were modified by different arrangements of porches and roofs so that there are 45 or 50 different appearances. The difference of design is farther accentuated by painting in different colors. The cost of these houses was nearly one-half million dollars, not including grading, sidewalks and plumbing. This addition to the town is provided with sewers, the lots are graded, the sidewalks are in place and trees have been planted to the value of about $50 per lot. This new addition to Carlinville is so different from the ordinary mine town that any connection between the mines and the dwellings would not be suspected.

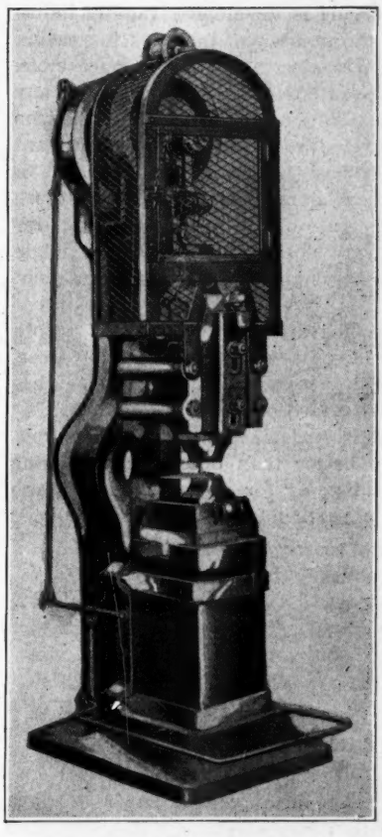
The company expects to operate the mine constantly and desires to attract labor of steady habit and a desire to work, in short, such class of labor as will desire to live in the kind of houses erected and become a permanent part of the population. It is not the intention that these houses shall be rented. The whole undertaking simply represents a desire on the part of the operating company to so house its labor as to promote contentment rather than unrest and attract a class of steady industrious labor.

Safety Guard for Power Hammers

Today the slogan "safety first" appears at numerous points in and around mines—at places where a careless movement might cost an employee more or less serious injury, or even his life.

The accompanying illustration of a safety guard installed on a Fairbanks power hammer shows a device which requires no sign to caution men working about this piece of machinery. An operator can give his whole attention to the work in hand, as this guard completely covers the working parts.

The device complies with the safety laws as enacted by the various states. While effectively protecting the operator the guard leaves the working parts accessible, both for oiling and for change of adjustment, through the door provided for that purpose. The guard is easily attached to such Fairbanks hammers as are already in operation, so that present users of these machines may readily secure protection for their employees.



THE GUARD IN POSITION

It is of interest to know that these power hammers are now made in sizes up to and including 500-lb. weight of ram for the heavier classes of work, such as is found in locomotive and car shops. Heretofore Fairbanks power hammers have been built up to 300-lb. weight of ram.

Coke Prices Fixed and Railroads to Make Diversions in its Transit

On Dec. 6, 1919, the Fuel Administration issued an order, effective Dec. 8, which related to the fixing or regulating prices of beehive coke and by-products coke, and also referred to margins or commission of middlemen, wholesalers or retailers of those products. In the latter part of the order authority was given to the Railroad Administration to make such diversions of coke in transit as may be necessary in the present emergency.

Curious Coal Deposits in Missouri

By Walter M. Brodie
New York, N. Y.

SYNOPSIS—The largest coal fields in Missouri lie in the western portion of the state. Many broken or irregular deposits or pockets are found in the central counties. Not a few of these contain both cannel and bituminous coal as well as small quantities of zinc blend in the same deposit. Although these deposits have in the past been worked with much irregularity, it would appear that their thickness and quality as well as the small amount of overburden covering them would make their operation particularly attractive as a stripping proposition.

THE chief coal field of the State of Missouri lies in the western counties, but coal is also found in the middle of the state and here and there in the eastern counties. Not all of these deposits are workable, however. To make coal mining profitable a number of circumstances must exist simultaneously, but as conditions are always changing and local demands constantly increase, many coal beds that now idle are likely to be worked in the future.

There will always be a fair demand for Missouri coal as there are great stretches of country west of the Mississippi River that do not produce merchantable fuel. This demand will be more insistent later, as the mines of Kansas, Arkansas, Oklahoma and Texas may in course of time be hard pressed to fill their own home markets.

Further, the State of Missouri is developing rapidly industrially. The soil is fertile, the number of farms is increasing everywhere, cities are getting larger, the country is accessible. The local demand is growing all the time and will in many cases permit a profitable production by small operators who could not undertake to develop a large field for a distant market. Under such conditions a considerable amount of mining may be done with local labor in favorable places with less friction than would be possible in regular mining districts where the workmen are not interested in the neighborhood, in the soil, or in helping to build up a permanent business.

The coals of central Missouri are of various kinds. Both bituminous and cannel coal have been found in various places, sometimes together, sometimes separately. Some of these deposits, even if not extensive, are of unusual thickness.

The bituminous coals of Missouri, like those of other states, vary in quality. Some are better than others for steaming purposes, or for blacksmithing, or for domestic use. Each kind, however, will find its particular use if it is produced clean and in quantity. The coals of central Missouri as a rule compare favorably with those of other fields. Though cannel coal is not found anywhere in extensive areas or in the same quantity as bituminous coal, it occurs in a number of places in remarkable deposits or pockets. It has a higher volatile content than bituminous coal and is thought to be derived from the spores and pollen and waxy material of marsh plants, and perhaps to some extent from animal remains, bituminous coals having been formed from the fibrous or woody parts of the plants in the original marshes. Decomposition, pressure and heat produced the characteristic change. Morgan County, Kentucky, is probably the principal producer of cannel coal in the Middle West, but Morgan County, Missouri, also has a number of deposits.

Cannel coal withstands the action of the weather remarkably well. It is tough and massive, does not soil, has a conchoidal fracture, ignites easily, does not cake in burning produces a friable coke, contains a higher percentage of volatile matter than of fixed carbon and gives a gas of more candlepower than the ordinary bituminous coal. It yields more oil when distilled, about two barrels instead of one to the ton of coal. The cannel coal of the United States has been described by George H. Ashley in Bulletin 659 of the Geological Survey (1918).

D. W. Eaton, who was surveyor of Morgan County, Missouri, for a number of years, in one of his communications points out that this county is separated into two characteristic drainage sheds by a dividing ridge running irregularly east and west. On the divide stands Versailles, the county seat. To the north and east the waters flow into the basin of the Missouri River, to south and west they flow into the Osage. North of this main divide the country is comparatively level, but near the larger creeks it is rough and broken, and here a number of outcrops of coal, lead ore and zinc ore have been found.

The original formations lie comparatively level, with local deflections and faults. The altitude of Versailles, Mo., is 1,001 ft. On the main divide, about nine miles west southwest from Versailles, the elevation above sea level is over 1,150 ft., while at the mouth of the Gravois where it falls into the Osage River, the altitude is a little less than 550 ft.; and this difference of elevation of 600 ft. reveals a great vertical section of the different strata.

Most of the rocks in Morgan County belong to the Upper Silurian period. On the top of these in places rest the rocks of the Carboniferous age. In the latter are found the coal deposits. The Devonian period, which should come between, is wanting. The Magnesian limestones of the Silurian period contain the deposits of lead and zinc ores, but some zinc blende has been found in the coal formation, sometimes interstratified with the coal.

The accompanying sketch shows how in an eroded region like that of Morgan County, Missouri, coal or any other stratified deposit may occur in the form of basins or pockets.

Suppose that coal shows on the surface at A, B and E. The owners of the ground from A to B may have a good showing of coal at distant points on their land and still have no quantity whatever, while nearby the owners from B to D may have good coal land with no showing whatever on the surface. When the ground is covered with much wash it often is difficult to determine without exploration just how the strata dip and where the coal may be found. The fact that

FIG. A

FIG. 1, A. A ROLLING ERODED COUNTRY

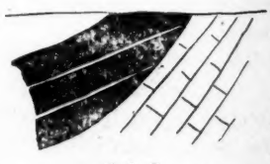


FIG. 1, B. CROSS SECTION OF THE SIMPSON BANK

it comes to the surface proves that in one direction it does not continue.

Bituminous coal beds, formed in marshes from fibrous plants, are generally supposed to lie in the place where they were formed. Cannel coal and clay beds formed from lighter and easily floatable material may have been carried by water some distance into depressions and channels before they definitely settled and finally were covered and solidified. It is therefore to be supposed that these deposits are eminently pockety and irregular and that a great vertical thickness of bed in one place in no way denotes any considerable horizontal extension.

The geological reports of the State of Missouri all lay stress on this fact and warn against imprudent deductions. In his report on cannel coal in the United States, 1918, George H. Ashley draws particular attention to this consideration. Before taking for granted the continuity of a cannel coal deposit, a prospective buyer must carefully follow the local custom of Missouri and insist "on being sighted" beforehand in a safe and reliable manner. The existence of coal between two points should never be assumed unless it is proved to be there by drill holes placed close together.

Stover Coal Bank in Morgan County, Missouri

The Stover Coal Bank is mentioned in the report on the "Coal Deposits of Missouri," by Arthur Winslow, state geologist, published by the Geologic Survey, Jefferson City, Mo., November, 1891, on page 169. It is one of a group of deposits situated some ten miles southeast of Versailles. This report says: "The coal is here creditably reported to be 70 ft. thick as proved by a shaft. It occurs on the side of a hill of Magnesian limestone, where it has been stripped and drifted into. A face fully 20 ft. thick was exposed here at the time of inspection. Similar deposits are worked in the immediate vicinity of Versailles and also occur west and north of that place."

The Stover Coal Bank lies in what is called the hill country. According to the "Versailles Statesman" of June 28, 1900, it was discovered many years ago by parties hunting for lead. But little was thought of the discovery until blacksmiths began to come for the coal, and it was hauled away little by little in wagons. In the latter part of the 80's a company got an option on the land, went back where the hill flattened out and sank a shaft. After going through some 32 ft. of dirt

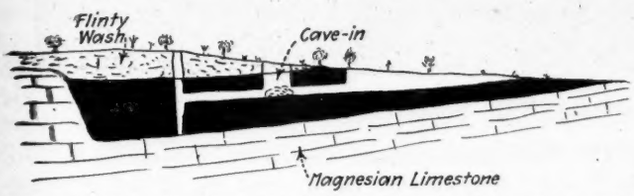


FIG. 2 CROSS SECTION OF THE STOVER COAL BANK

they hit the coal, and then for more than 70 ft. they found hard bituminous coal, making the bottom of the coal 104 ft. below the surface.

More excitement was created over this discovery than anything that had occurred in Morgan County before. Different parties rushed in and tried to secure this property or any other property adjoining, getting options and making contracts. They finally ended by bonding the whole thing and getting into litigation that lasted for ten years. This litigation concerning over 5,000 acres of the most promising coal lands, together with the troublesome conditions of the country during the closing years of the past century, virtually put a stop to everything.

About this time various people were becoming interested in the other Morgan County coal fields and mineral lands, and teams, scrapers and men came to build a railroad from Versailles to the Stover Bank, but this movement came to nothing. About 1898 the litigants became tired, all interests were brought into court in such a manner that the property was

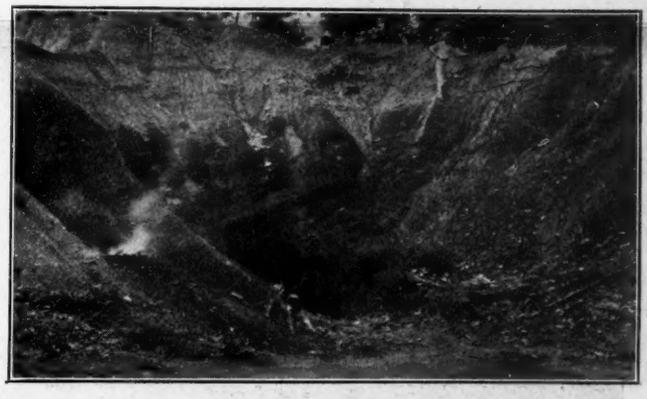


FIG 3. DRIFT ENTRANCE, STOVER BANK

sold and bought by Mrs. Halderman, a rich woman from Kansas City. After a certain time a company was formed by a promoting firm in Chicago, stock was sold, but only one payment was made to the owner. Again the property got into litigation and another ten years passed before the seller got back her ground. Then the owner died. Finally the property was bought from the estate by one of the heirs. He holds it now, but it lies idle and has not had the economically necessary attention.

At one time a considerable amount of drilling was done. An old map shows a number of drill holes, but the records

FIG. 4. ANOTHER VIEW OF STOVER BANK

in the course of disputes have been carelessly (or perhaps carefully) lost and no one knows how much coal this particular deposit or the property contains.

For a while the coal deposits or coal pockets of Morgan County had a reputation. At present the owners are afraid of having the old fame dimmed by new explorations. Those who have coal lands for sale do not wish any preparatory drilling done for fear that the actual results may not come up to the expectations of former days.

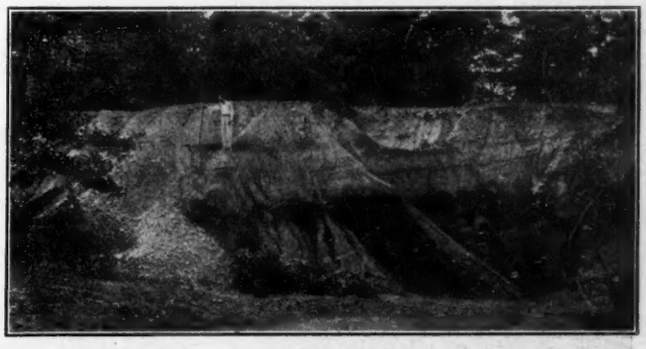


FIG. 5. SHOWING THE THICK COAL OF THE STOVER BANK

FIG. 6. COAL DEPOSIT EAST OF STOVER PIT

FIG. 7. VIEW OF THE STOVER CAVE-IN

Up to last autumn the entrance or driveway into the workings of the Stover Coal Bank was open. A team of horses and a wagon used to drive in and bring out the coal. We are told how loads of coal were taken out by turning the team around in the workings, breaking the coal from the roof into the wagon and driving off with it without even using a shovel. There are a few hundred feet of workings all in coal, connecting with a shaft at some 50 ft. vertical distance from the surface. A couple of chambers are some 30 ft. in diameter, with clean coal all around. In the shaft, which was the farthest accessible development and was covered over inside the workings, some 30 ft. of coal could be seen last fall.

FIGS. 8 AND 9 SHOWING NATURE OF CAVE-IN AT STOVER MINE

During the past winter, some 50 ft. from the entrance of the adit, the roof of the main driveway, which was all coal, fell in after standing for 30 years and more. The cave-in extended to the surface, which here consists of loose dirt and soil over of coal of nearly 20 ft. above the old workings, or say nearly 30 ft. in all. In the shaft the coal is reported to reach 40 ft. farther down, but this is now under water.

The great vertical thickness cannot be explained by the strata standing on end. As shown in the accompanying sketch, toward the east the coal comes to the surface. At

FIG. 10. YARD OF THE STOVER COAL BANK

one place, in this direction, 200 yd. away, an old pit is said to have gone through 10 ft. of coal. Toward the west the coal gives out suddenly and little exploration seems to have been done in that direction, probably because no coal was found there. Toward the north, however, for a distance of some 3½ miles, a number of pits have shown coal in various places. There are no authentic records, it seems, of these pits, though they are marked on a blueprint.

South of the Stover Bank coal has been found as shown on this map. Figs. 3, 4, and 5 show the entrance to the mine, from which it seems no more than about 2,000 tons at most have been removed. From where the man shown in each of the pictures stands, downward, everything in coal, and it will be noted that the general dip of the stratification is not much inclined. Over the coal shown in the pictures there is only surface wash and soil, no rock, and the picture gives a fair idea of what would have to be removed to expose the coal. The coal roof in the workings inside the mine is solid, and though here and there cleavage planes are found, only in one place, that above mentioned, has the roof dropped in for want of care and attention. The floor of the yard in front of the entrance is coal.

Fig. 6, taken east of the Stover mine yard, shows the coal at the surface of the ground. There is hardly any soil over the deposit here. The man in the picture stands on coal.

The workings inside the mine are about 10 ft. high. The coal forming the roof over these workings is shown in Figs. 7, 8 and 9, taken in the hole where the roof caved in. In Fig. 7 the man holding the stick stands on the end of a 10-ft. post in the workings, and everything up to the handkerchief is coal. Fig. 8 on the north side of the cave-in shows again the man standing on coal and gives an idea of the small amount of overburden. Fig. 9 shows the coal reaching almost up to the surface.

On an old blueprint, marked J. M. T., and dated Feb. 23, 1893, the following data are marked:

⅛ mile S.S.E. of the Stover Bank in S.W. ¼ Sect. T 5-41—R 16—a shaft, 25 ft. of coal.
1 mile S. of the Stover Bank in N. ½ Sect. T 7-41—R 16—two shafts, 77 ft. of coal.
⅛ mile N. of the Stover Bank in N.E. ¼ Sect. T 6-41—R 16—104 ft. deep, 70 ft. of coal.
½ mile N. of the Stover Bank in S.E. ¼ Sect. T 31-42—R 16—Bishop shaft, 4 ft. of coal.
¾ mile N.W. of the Stover Bank in S.W. ¼ Sect. T 31-42—R 16—Barkhart shaft, 24 ft. deep, 4 ft. of coal.
¾ mile N. of the Stover Bank in S.E. ¼ Sect. T 31-42—R 16—Brogler shaft, 35 ft. deep, 17 ft. of coal.
1¼ mile N. of the Stover Bank in N. E. ¼ Sect. T 31-42—R 16—Burkhart shaft, 35 ft. deep, 25 ft. of coal.
1½ mile N. of the Stover Bank in S.E. ¼ Sect. T 30-42—R 16—Burkham shaft, 20 ft. deep, 16 ft. of coal.
1¾ mile N.N.W. of the Stover Bank in S.W. ¼ Sect. T 30-42—R 16—Bradshaw shaft, 30 ft. deep.
2⅛ mile N. of the Stover Bank in N.W. ¼ Sect. T 29-42—R 16—Porter shaft, 45 ft. deep, 18 ft. of coal.
2¼ mile N. of the Stover Bank in N.E. ¼ Sect. T 30-42—R 16—Crane shaft, coal.
2¾ mile N. of the Stover Bank in S.E. ¼ Sect. T 19-42—R 16—San Lamb shaft, 35 ft. of coal.
3¼ mile N. of the Stover Bank in N.W. ¼ Sect. T 19-42—R 16—shaft, 80 ft. deep, 70 ft. of coal.
3¾ mile N. of the Stover Bank in S.E. ¼ Sect. T 19-42—R 16—Ruyan shaft, 24 ft. deep, 14 ft. of coal.

Now it is not possible to judge offhand the reliability of these data, but a trip over the surface verifies the existence of most of these old workings; and although the pits are now caved in or are full of water, there are plain signs on the dumps that coal was found in a number of places.

The coal therefore in the neighborhood of the Stover Bank does not fill a single pocket or pothole, but probably formed part of a bed or run that has been washed away partly or mostly by erosion, but still may have left here and there sufficient quantity to make, under favorable circumstances, extraction profitable for a number of years. In this kind of country, however, it is absolutely necessary to test the ground systematically with drill holes placed close together in order not to be deceived by imaginary quantities, especially so since in an east and west direction no extent of field has been shown, and further since the coal-bearing rocks do not extend far in any direction.

It is curious that on the Stover Coal Bank, which now has been known to exist for nearly half a century and which probably is one of the thickest known deposits, no machinery of any kind has ever been used thus far. There is a home-made hand windlass over the Arnold shaft which communicates with the workings, but it is a crude affair, probably put up provisionally by a farmer to take out water occasionally when purity is not required.

Fig. 10, taken in the yard of the Stover Coal Bank, both the man in the picture and the observer taking the photograph are standing on the coal of the deposit.

How far the coal body of the Stover Bank extends probably was tested fairly well in years past. There are signs and rumors that a number of holes were drilled, but the records are not available. Still, whether there be coal in quantity or but little more than what actually can be seen in the workings, the Stover Coal Bank is an interesting place to visit and seemingly worth more attention than it has received for a number of years. Its present main disadvantage is that it lies a considerable distance from the railroad in what is now a rather isolated neighborhood. If it had railroad communication the mine would be well located and exploration round about might show other pockets worth development.

FIGS. 11 AND 12. VIEWS AT THE BISHOP COAL PIT

An analysis of the Stover coal was made by N. Lehnen, Ph.D., analytical and technical chemist, of St. Paul, Minn., and is dated Jan. 5, 1900. Dr. Lehnen states that he made a report on these lands some four or five years earlier, calls

FIG. 13. THE PUMP AT THE BISHOP PIT

FIG. 14. VIEW OF SIMPSON COAL BANK

the coal a very fine quality of bituminous, equal to Pennsylvania coal, and gives the following analysis:

No. 1 Specific gravity.....1.19 per cent	
Fixed carbon	45.80 per cent
Volatile matter	42.90 per cent
Moisture	2.10 per cent
Ash	9.20 per cent
Total	100.00 per cent
ANALYSIS OF COKE	
Fixed carbon	82.38 per cent
Ash	17.62 per cent
Total	100.00 per cent
ANALYSIS OF VOLATILE MATTER	
Coal tar .....15 per cent	33.333 per cent
Carbonated hydrogen .....30 per cent	66.666 per cent
Total .....45 per cent	100.000 per cent
No. 2 Specific gravity.....1.12 per cent	
Fixed carbon	57.20 per cent
Volatile matter	36.60 per cent
Moisture	3.40 per cent
Ash	2.80 per cent
Total	100.00 per cent
Yield of coke.....60 per cent	
ANALYSIS OF COKE	
Fixed carbon	95.07 per cent
Ash	4.93 per cent
Total	100.00 per cent
ANALYSIS OF VOLATILE MATTER	
Coal tar	31.395 per cent
Carbonated hydrogen	68.605 per cent
Total	100.000 per cent
Or One Ton of the Above Yields	
Coke 60 per cent or .....1200 lb.	
Coal tar .....251 lb.	
Gas .....549 lb. or 14666 cu. ft.	

At the time the Stover Coal Bank was being promoted a graded roadbed was partly constructed from a point between Marven and Barnett on the Chicago, Rock Island & Pacific R. R. to the mine. This road was to be some 4 miles long. It was graded for some 2½ miles but was then abandoned.

The grade and right-of-way is said to belong in fee to the railroad. Though the grade does not reach nearly to the Stover Bank, it is probable that there is some coal within a short distance from it now, as some of the exploration pits

FIG. 15. THE SIMPSON STRIPPING

north of the Stover Bank are situated not far to the west of the grade. The fact that the grade was not finished leads to the supposition that the railroad at the time had little faith in the enterprise.

About ½ mile north of the Stover Coal Bank some coal was being mined this summer at the Bishop shaft on ground of the same owner. The coal here also comes to the surface, and a pit sunk into it somewhat over 20 ft. deep is in coal all the way down. How much thicker the coal is is not known.

Fig. 11 shows this working and gives an idea of the light overburden. To the left in the picture is seen a small gasoline-driven pump. It stands on coal.

Fig. 12, looking towards the west, was taken across this same coal pit. The man shown in the picture stands on solid coal, which lies almost horizontal, and here was covered with a small amount of wash and soil. The coal breaks out in a little gully on the eastern side of the working.

Fig. 13 looks toward the east. The pump stands on coal. The overburden here is very light. There are many croppings of coal in the same neighborhood.

The Simpson Coal Bank of the Monarch Coal and Mining Co. in Manitou County, Missouri.

The deposit of coal known as the Simpson Bank is another interesting occurrence. It is situated in Manitou County, about 10 miles east of Versailles, on the road to California, Mo. Arthur Winslow describes it as follows in "Coal Deposits of Missouri," page 169: "The deposit is located in the foothills of the valley of Barro Fork and has been exposed by the erosion of the valley. The contact with the limestone country rock is only seen on the north side. The coal is of the cannel variety. Pyrite occurs in sheets along the joint planes and also in thin films in the finer crevices where it is more difficult to remove. Zinc blende occurs in a similar manner.

"Over the cannel coal lies about 5 ft. of bituminous coal of rather poor grade. The occurrence is illustrated in B, Fig. 1. The coal here was found to reach 90 ft. in depth at the end of the open cut. A working driven 140 ft.

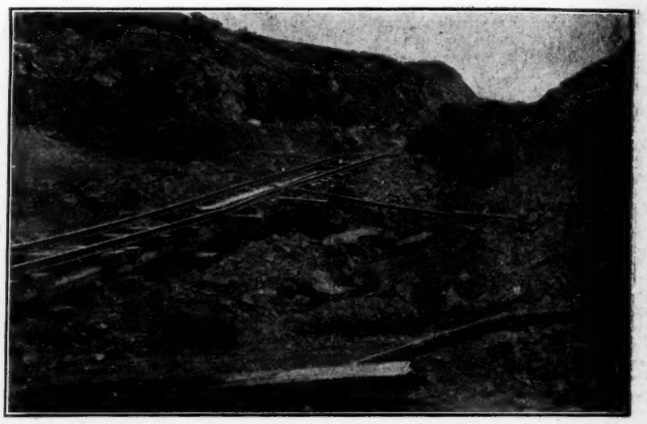


FIG. 16. ANOTHER VIEW OF THE SIMPSON STRIPPING

south from the foot of the shaft is said to be all in cannel. In the open cut the coal dips some 45 deg. but farther to the south it lies flat."

George H. Ashley, in "Cannel Coal in the United States," gives the extent of the deposit as 400 ft. long by 150 ft. wide and states the thickness of the cannel to be 45 ft. where it lies level. He states that the total contents of the deposit does not appear to be over 75,000 tons. What new developments have been made recently I cannot state. At the present moment the overburden is being stripped off with a large steam shovel, which fills cars drawn by a small locomotive. In the quarry a smaller steam shovel loads the coal into cars which are drawn up an incline by a stationary engine.

Figs. 14, 15, and 16 show the coal quarry. Fig. 14 is taken looking north. The deepest workings are in line with the incline, to the left, where the smoke rises. Fig. 15 shows the coal-handling steam shovel in the foreground and in the middle distance the large steam shovel stripping off the overburden, which here is from 20 to 25 ft. thick. On the right is the old coal pit, where, it is reported, 94 ft. of coal were passed through. Fig. 16 shows the inclined car track going down into the coal quarry, with coal all around. The company has 9 miles of railway to connect its mine with the Rock Island R. R. The coal is shipped mostly to Kansas City.

Coal Bank of the Ouacheta Coal and Clay Products Co. in Morgan County, Missouri.

The Ouacheta Coal and Clay Products Co. is operating some 5 miles northwest of Versailles. It lately has made a railroad connection about 4 miles long and is stripping a body or pocket of coal by means of scrapers. The property has

changed hands a number of times and it is reported that the company has made lately some valuable new discoveries.

Some years ago this property consisted of 378 acres, and drill tests and prospect shafts had been put down on about 120 acres. The drill at one point showed, it is stated, 51 ft. of coal. This is a cannel coal of good grade. Fig. 17 shows the scraper used to remove the soil and dirt from off the coal. Fig. 18 shows this scraper at work. In the left foreground the coal pit, at the time the picture was taken, is shown full of water. Fig. 19 shows the coal quarry, which while the railroad connection was being made was allowed to fill up. A train of cars drawn by a locomotive is an adjunct to the scraper.

Coal Near the Town of Versailles, Morgan County, Missouri

In the immediate neighborhood and east of the town of Versailles coal has been taken out in small quantities in various places. George H. Ashley mentions these localities as pockets of cannel that have been worked out—the Martin mine, 1½ miles east of the town; the McClure or Huffman working, ½ mile further north, and the Price Bank, north of the McClure. But it seems that it was not always the coal deposit that was worked out. The thickness of the coal here is said to be from 30 to 40 feet.

FIGS. 17 AND 18. VIEWS IN THE ONACHETA STRIP PIT

These different places and a few more were worked in a small way some 30 years ago before the Rock Island railroad was constructed. At the time there was only a small local demand for coal, and as roads were in poor condition most of the year and the load had to be hauled uphill by teams, the work was not carried on in an energetic manner.

The Huffman Coal Bank

One of the old quarries, has for a long time been known as the Huffman Coal Bank. Like the others it is situated in one of the valleys or gulches near town, where the coal happened to show on the surface. The history of this particular place is characteristic and I therefore give some particulars taken from the "Versailles Statesman" of June 28, 1900.

"The Versailles Coal and Mining Co. is composed of several members who live principally in Johnson County, Missouri. After visiting Morgan County and seeing for themselves, they formed alliance with a certain non-resident gentleman who said he could buy the lands chosen by the company cheaper than anybody else could. He was employed to buy the land with the understanding that he was to become a member of the company. He bought the coal land at very reasonable rates, but it is said that he represented to the company that it cost several thousand dollars more than it did. The company seemed satisfied at the time and put men and teams to work at the coal bank, which was already open on the lands about 1½ miles east of Versailles. They shipped several carloads of this coal last summer and immediately after they bought the lands. The coal being of good quality met with a ready sale. Everybody thought that this company, which had just incorporated with a capital stock of $100,000, would prove to be the best mining company in the country. Everything was moving along nicely and everybody was satisfied till one day one of the members discovered that the company had paid several thousand dollars more for the land than the non-resident agent had to pay for it. The mine was closed at once and the members went to quarreling among themselves and the quarrel still is on."

This was in 1900. It is said that from this property several carloads were sold in Sedalia and that there was a good demand for more. Also that drilling was done on the land for several months and that coal was found in some of the drill holes. Old workmen tell that some of the pillars were robbed, that a part fell in and that since then no work has been done. They say that the coal did not give out. The company did.

The Lucy Martin Mine

About half a mile south of the Huffman mine and east of Versailles lies the Lucy Martin mine. Here the coal shows again on the surface in the valley and was quarried, off and on, for several years, about 30 years ago. The owner was an old man, who went blind and could not attend to the business in which, according to his daughter, he placed great faith. After his death the property was sold but never was opened up again.

The indications of coal near the town of Versailles seem to extend for some distance. Several people in the town, with property south of the divide on which the town is built, have told me that they went through coal in their drilled wells,

FIG. 19. ONACHETA PIT FILLED WITH WATER

and several wells on the farms round about to the north are said to have shown coal in the drillings.

Few reliable or exact data are to be had, but from a little valley in the town itself coal was mined before the Civil war for local use. This working was on the Cardell property, corner of Stephens and Hudson Sts., in the northwest portion of Section 6.

Labor and Its Responsibilities*

By Charles Piez
Chicago, Ill.

ON Nov. 9, fully conscious that the bituminous coal miners had declined to submit to the arbitration offered by the President, a series of demands which were so extravagant that they would have imposed on the consuming public a burden of, at least, a billion dollars a year, the Executive Council of the American Federation of Labor, after a four-hour session, pledged to the United Mine Workers the full moral and financial support of its four million members in the bituminous coal strike which the Government, through Judge Anderson in the Federal Court at Indianapolis, had declared unlawful.

In commenting on this action, one of the labor executives said that same evening:

"This means that the strike order will not be rescinded. *The time has come when the people of the United States should find out once and for all if its government has the power to make men work against their will.*" If this were the outburst of some splenetic business agent it would not deserve mention, but when it represents the views of conservative labor leaders it is apparent that the error in the conception of the real situation is epidemic, rather than sporadic.

It is difficult to believe that such experienced and astute leaders as Mr. Gompers and his colleagues should really feel that the action of the Government in Indianapolis meant a return to involuntary servitude for the workers. If they do, then labor is under a most peculiar and unwholesome delusion as to its rights and privileges, and the organization which has recorded itself against oppression of every kind has itself become a most inconsiderate and merciless oppressor of the general public.

At this time organized labor is stronger in membership and stronger in solidarity than ever before in its history. It is no longer a suppliant for popular sympathy in its struggle for recognition. It works short hours, receives high pay, and has unlimited opportunity for employment. It has attained these exceptional advantages so quickly and so easily, through the extraordinary conditions attendant upon the war, that it has armed itself with a bludgeon and is preparing to beat its way to the full and exclusive possession of the fleshpots of established industry.

ALL CAUTION IS GONE

There is evident in its methods and its aims none of the care and consideration that should attend the exercise of great power. It has thrown caution to the winds, and is prepared to wreck the state itself in its blind intent to follow the course laid by radicalism. Neither want nor economic necessity can be urged as the cause of the epidemic of strikes from which we are at present suffering. They result, without doubt, from carefully laid plans to create discontent and to develop suspicion and class hatred. So skillfully and methodically have these plans been laid, so adroitly have revolutionary leaders worked from the inside of the American Federation of Labor, that even its conservative executives are today, in their desire to compromise with radicalism and maintain the integrity of the Federation, giving countenance to methods and doctrines which, if tolerated, will subvert the very foundations of our economic and social structure.

I came in frequent contact with Mr. Gompers and his associates during my connection with the Emergency Fleet Corporation, and I found nowhere more patriotic and earnest cooperation to keep the industries going without interruption during the national crisis. I feel free to say, therefore, that I believe Mr. Gompers and his associates are unaware of the menace and dangers of the course that has been laid for them. Radicalism decided on its policy to bore from within the American Federation of Labor some years ago and no effective steps were taken by the leaders of the Federation to prevent this honeycombing. Constant compromise may build up a large association, but it takes courage and unswerving fidelity to principle to build up a strong and effective organization.

The executives of the American Federation of Labor have yielded too much to the desire for numbers, and they have, therefore, before them a large job of housecleaning to re-establish themselves in the public confidence. They have missed several opportunities within the last twelve months to show that, in their growing strength and increasing power, they were still mindful of their obligations to the public.

When the Metal Trades Council of the Puget Sound District called a strike last January in defiance of an existing and unexpired agreement entered into between the Federation and the Government, its members should have been ordered back to work by the international presidents of the crafts involved, and failure to comply with this order should have resulted in a withdrawal of the charters. But the officers of the Federation contented themselves with being sympathetic with the Government's efforts to enforce a labor contract and lost a golden opportunity to put themselves sternly and uncompromisingly on record against a breach of agreement, and against the radical element in its membership that was guilty of so violent a disregard of common business honesty.

Again, the Federation should have appreciated the difference in obligation between a policeman sworn to protect the life and property of the public and a workman engaged in manufacturing. It should have set itself squarely against a strike of policemen, under any and all circumstances, and should have advocated other ways to redress wrongs, if wrongs existed.

SUPPORT WRONGLY PLACED

And in the steel strike, the American Federation of Labor gave its countenance and support to Foster, an avowed syndicalist and revolutionist, a man who had disseminated among our alien workmen, principles wholly at variance with American institutions. Why should the American Federation of Labor lend its encouragement and aid to an organizer who has publicly announced that "the wages system is the most brazen and gigantic robbery ever perpetrated since the world began"; that "the syndicalist allows no consideration of loyalty, religion, patriotism, honor or duty to stand in the way of his adoption of effective tactics?"

Does not the American Federation of Labor surrender its vaunted position of conservatism and loyalty to American institutions when it employs exponents of such doctrines in its campaign for new members?

Can there be any question that even the conservatives among our labor leaders are tolerating the specious arguments and false promises of the extremists in the labor group and that in facing the situation today, and in looking for a remedy, we must appreciate that the radicals in the Federation, though I believe in the minority, have temporarily raised the red flag above the red, white and blue?

Conservative, sane leaders of the Federation must either declare themselves in favor of radical doctrines and action or they must have courage to assert themselves, to re-establish for the organization the groundwork of American principles

*An address made before the annual meeting of the American Mining Congress, St. Louis, Mo., Nov. 21, 1919.

and ideals, even if that re-establishment should split the Federation. The public is going to insist that it be no longer victimized by men who intend to control industry and society through a framework of soviets, and it is not going to submit to constant interruption of the vital industrial processes when revolutionary propaganda, and not economic necessity or want, is the cause of the interruption. The public is insufficiently organized for promptly and effectively meeting a situation like the present, but it can insist in no uncertain way that its legislators and its representatives bear in mind that obligations, as well as privileges, go with American citizenship, that this is a government by majorities, and that no organized minority will for any length of time be permitted to prey without hindrance on the majority. France has, in the national elections just held, declared herself overwhelmingly against radicalism, and America will declare herself similarly when the opportunity comes. For our people are just beginning to understand and appreciate the reason for the existing unrest and the sinister purpose of the leaders who are fomenting it. They are growing more critical of the aliens who have sought our shores; they insist on knowing whether these aliens have come here to seek a livelihood in the American way under American institutions, or whether they propose to enforce upon us a new form of Government born of immature and visionary minds amid the stress and discouragement of foreign oppression.

THE SITUATION WILL BE MET

Congress will, without question, meet this present invasion of irrationalism and revolutionary propaganda by suitable laws that will enable the Department of Justice to deport aliens who are unwilling to accept the American principles of government, or who are guilty of slanderous misrepresensation of our institutions. We want men of foreign birth, men who will adopt our principles of government and assist in improving them, but we want no unassimilated foreign element to become a cancer spot to our institutions in the future. We are going to handpick our immigrants hereafter and we are going to return some troublesome examples that have sought our shores. That will be the first step in our return to sanity.

The second step should consist in impressing on the sane leaders of labor the necessity of getting a proper conception of what wages are and who pays them. Among the many economic delusions of the day is the one that capital pays wages and that high wages can be paid out of profits and surplus, or out of capital itself without increasing output or advancing prices. Not only workmen, but many of our legislators, forget that capital, as applied to the industries, represents investment in property, in machinery and equipment, and in material in process of manufacture, and that the cash to meet wages, the cost of materials, of power, and all the other expenses involved in manufacture must be secured out of the selling price of the product, out of the money derived from the user or consumer.

If wages increase and production falls, an almost universal industrial occurence at this time, prices must go up, not only to meet the increased wage, but also in proportion to the decreased output. Wage earners are apt to forget that they are themselves the largest consumers of manufactured commodities and that they must, therefore, pay by far the largest share of any increase in the cost of production. If any group or class, like the bituminous coal miners, for instance, attempts, under some wrong economic theory, to improve the opportunity for labor by reducing output and at the same time insists on an increase in wages, the burden falls most heavily on other groups of wage-earners, who must retaliate in some equivalent form to restore the economic balance.

So much has been said of the necessity of increasing production and reducing consumption to bring down the cost of living that further repetition seems unnecessary. But this economic axiom is not yet admitted by labor leaders to indicate the right policy and constant reiteration is, therefore, essential to insure its wider acceptance.

It is well to remember that the disinclination of labor leaders to accept this basic truth is by no means due to lack of intelligence on their part, but is due rather to the fact that for years organized labor, both here and abroad, has endeavored to improve its condition by keeping demand in excess of the normal supply. Labor adopted, in other words, the principles of monopoly and such measures as the limitation of the number of apprentices, the consistent opposition to any scheme of wage payment that would tend to stimulate output, and the restriction of the output of the individual to the capacity of the least skilled, naturally resulted. Without questioning the wisdom of this labor policy in the past, it is proper to indicate that under conditions as they obtain today and as they are likely to obtain during the next few years, a continuation of this policy is destructive of the best interests of labor itself. Restriction of output may appear wise during periods of reduced consumption, it is never wise during periods of unlimited demand. There is no possible hope that the vastly reduced productive processes of the world can meet the normal demand and make good the ravages of the war in years to come; and labor's present opportunity lies in securing high wages for large production so that earnings will increase faster than the cost of commodities and faster, therefore, than the cost of living.

THE FINAL STEP

The third and final step to meet the present situation is to insure that large unincorporated associations of either employers or employees be brought within the reach of civil process in every jurisdiction. These organizations, with their vast membership and their great defense funds, are in position to do infinite harm to the public without accepting any responsibility for the acts of either their individual members or their leaders. For the past twenty-five years labor organizations, particularly, have been exempted from every piece of legislation that has been enacted to safeguard the public against the aggression and extortion of combinations.

When associations grow as powerful as these labor organizations have grown in the past few years the only protection against irresponsible action lies in bringing them within the law. It has been suggested that this can be brought about by enacting a law which will provide that any voluntary association of seven or more members may sue or be sued in the name of the association. There seems to be no good reason why such an act should not exist in every jurisdiction.

A second piece of legislation that commends itself is that contained in the Cummins Bill which provides for compulsory arbitration in railroad labor disputes. Because continuous operation of the transportation systems is absolutely vital to the very life of the nation, no group of men whom chance has placed in the employ of these systems should have the right to conspire collectively against the public interest. It is not necessary to forbid a man to quit work if he so chooses, but it is fair and just that men engaged in an employment vital to the nation shall be prevented from using their great power in combination to practice extortion on the public. Proper tribunals for the determination of wages and the adjustment of disputes should be provided, but the workers on these systems should, in consideration of the establishment of such machinery to insure fair wages and just treatment, and in consideration of the paramount interest of the public, waive their right to strike.

A further piece of legislation which has been suggested as a possible preventive against premature, unfair and unnecessary strikes, but one which, it is thought, will not prevent strikes when they are necessary as a last resort to secure justice, provides that "It shall be unlawful for any person, association or corporation wilfully to induce ,aid or support any strike, lockout or other kind of industrial warfare;

(a) Of employees whose terms of employment are fixed by the state or any political subdivision thereof;

(b) In violation of an agreement, or for conditions of employment conflicting with any agreement between an employer and his employees, or an employer and any labor union;

(c) In violation of any arbitration award or for conditions of employment conflicting with the terms thereof;

(d) To enforce demands where the party against whom the demands are pending is willing to submit such demands to arbitration by any method agreed upon, or to any public agency, authorized by law to deal with such matters;

(e) Without first giving the parties involved a reasonable opportunity to consider and act upon the terms sought to be enforced thereby;

(f) Where there is no trade dispute involving issues of direct benefit to the parties involved; provided, however, that nothing in this section shall be construed to forbid the mere quitting of work or the discharge of employees.

The state or any political subdivision thereof, or any person, firm, association or corporation, when injured or threatened with injury by anything forbidden in this act, shall be entitled to all of the appropriate civil remedies in law and equity.

This bill is not framed with the intention of depriving men of the right to strike when that appears the only way to meet the economic pressure exerted by the employers, but it is framed with the purpose of instilling into the mind of organized labor a proper sense of responsibility for acts which will cause harm or damage to other parties involved in a labor controversy. The bill does not declare any acts criminal, nor does it impose on any department of justice the burden of enforcing the law. It simply affords the persons injured by such forbidden acts an opportunity to stay the injury by an injunction, or to recover damages in some court of justice. It will, if enacted, assist in building up, among the members of the unions, that sense of responsibility which is essential to the proper conduct of union affairs.

If industrial strife is ever to be brought down to sane limits it must be done by enforcing responsibility. No single class must be permitted to run wild beyond the reach of the law. If there must be collective action then let us so frame our laws that there will be collective responsibility.

Success and Failure

Two young men who were fortunate enough to graduate from their home-town mining school, each with a high mark, started in immediately to attain their ambitions. Since they were friends, they attended many meetings together, where prominent men in the mining industry occasionally lectured. At one meeting the topic discussed by one speaker was "Success and Failure."

In conclusion the speaker said: "There are two things before every man in life—success and failure. The way to success seems hard and long, but failure may come at any moment. Therefore it might be wise for the man who meets with either to be able to conscientiously feel that he is not ashamed to go back and work with his hands once more. He should be able to say, 'I was a man, in a man's position.'"

After the meeting was over, John, who seemed to think that there was some common sense in the speaker's words, asked his friend Will what he thought about the advice given. Will, who seemed to think the speaker wasted time and breath, said: "It might be all right, but whoever heard of a boss being ashamed to go back and work with his men? No matter what kind of a man he was in the position, he was there to advance the interests of the company and not those of the men." But with this view his friend did not agree.

Some years later these men met again at a gathering similar to the one mentioned above. John spoke to his friend concerning their respective ways of handling the job of mine foreman, to which both had risen.

It seemed as though everything was coming John's way and that his friend was having a difficult time of it. His men would strike occasionally, and he had to answer many questions from his superior. Finally their conversation drifted to the amount of supplies each used at his mine.

Will said: "We use very little supplies at our mine, especially timber. This I think is often used where it is not needed at all, and since our roof is very good, I never allow my assistant to order timber without my consent. Furthermore, I am going to watch this item more closely from this time on, and I am going to produce coal cheaper than what the company bought it for."

John, who was very considerate of his friend's feelings, replied: "Perhaps you had better be careful you don't bring on a squeeze."

With that his friend laughed, and they parted, only to meet some months later. And this time John's friend was looking for some advice. The first thing he asked him was, "How is it that you have such easy sailing in your work?"

To this John replied: "I will tell you candidly my honest opinion. It appears to me that you think you know it all. It is quite different with me. You see, when I started the job I considered that the man whose place I took must have been efficient in the position. Otherwise he would not have been promoted to superintendent. So before he left I learned from him his plans for the future development of the 'diggin's,' as he was more acquainted with them than I.

In your case, you started right in after the boys for more coal. And when I mentioned the possible chance of your methods drawing on a squeeze you laughed at me, and ignored the danger incurred. Now it has come, and your trouble has started. I have learned with regret but not surprise that you are to be discharged on the first day of next month. And if I may be permitted to do so, I would like to give you a little warning about mine squeezes.

"When you take the legs out from under a table, the top will fall, unless it is supported by some means or other.

If you ever get another job as foreman, my suggestion to you would be that you use your own judgment about producing coal cheaper than the company bought it.

And now, while we are on this subject, let me turn your attention back to the address that was delivered some years ago by Mr. ——— at the mining institute. You doubtless remember that he stated that there are two things before every mine foreman—"success and failure."

Fuel Administrator, Dr. Garfield, issued the following order giving the Railway Administration authority to issue regulations covering the delivery, use and consumption of coal, coke or other fuel or of power generated or produced by the use or consumption of coal, coke or other fuel.

Regulations were issued to make such restrictions uniform over the entire country to aid in the conservation of coal.

Electric railways and manufacturing plants, stores and offices were ordered to cooperate in arranging with the provisions of the order schedules, days and hours of work to permit the maximum utilization of transportation equipment during the coming winter season.

Two Deaths from Blackdamp

By Donald J. Baker
Pittsburgh, Penn.

SYNOPSIS: Three men entered an old slope wthout a flame lamp of any kind. Two were overcome by an atmosphere deficient in oxygen and died before they could be removed. The third man escaped uninjured. A rise of water had imprisoned the air in this slope. And the three men walked into a pocket of black damp. This accident emphasizes the importance of carrying a safety lamp when entering any old or abandoned workings.

A distressing accident that comes under the head of preventable, recently occurred at the No. 5 Manway of the Piney Run Mine, ¾ mi north of Blaine City, Clearfield County, Penn., when J. F. Stott of Philipsburg and R. M. Caldwell of Clearfield were overcome by air deficient in oxygen. The No. 5 Manway is on a 19 deg. slope, and the workings at the bottom have been abandoned for the past ten years. The accident has driven home to the miners of Clearfield County the conviction that it is nothing short of a big gamble for puny stakes to enter abandoned working places without taking precautionary means for the detection of gas or bad air.

An account of the accident as told by George Rainer of Philipsburg is as follows:

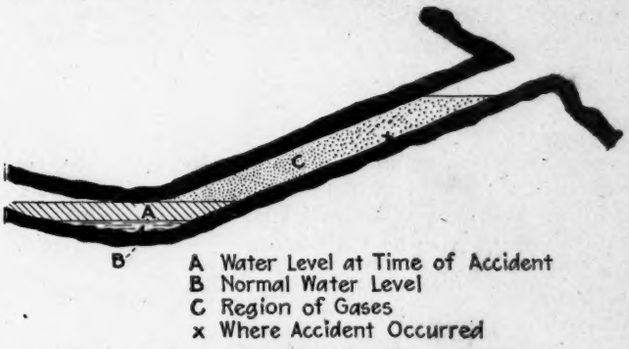
Mr. Stott, accompanied by his wife and niece, Mr. Caldwell and Mr. Rainer left Philipsburg by auto for Blain City, where it was Mr. Stott's desire to inspect some coal holdings owned by Mr. Caldwell with a possible view toward purchase. Upon arriving in the vicinity of the No. 5 Manway of the Piney Run

GEORGE RAINER OF PHILIPSBURG

Mine, the car was stopped and the three men of the party alighted and proceeded in the direction of the slope. Reaching the slope, Mr. Stott remarked that as he was the only practical miner in the group, he would lead the way to the bottom, using a pocket flashlight for illumination. Proceeding at intervals of 3 ft. with Mr. Rainer bringing up the rear, the descent was begun. About 40 ft. had been covered when Mr. Stott was noticed to fall against the timbers on the right side, while a second later Mr. Caldwell fell on the left. Mr. Rainer not suspecting the presence of gas, believed the men had stumbled, and tried to assist Mr. Caldwell to his feet, when he was himself partially overcome, but succeeded in raising himself before he fell and in moving backward toward the opening. Fortunately his head cleared the gas level. Reviving in the air, he struggled to the surface and summoned aid from a boiler house located nearly 2000 ft. from the slope. B. R. Bodle and Frank Linder were in the house at the time and promptly went to the assistance of the two men in the slope.

The account from here on is best related by Mr. Bodle.

Hurrying to the Manway, the forms of Mr. Stott and Mr. Caldwell could be plainly seen, as their progress down the slope had not reached a stage that necessitated the use of the flashlight. Several attempts at rescuing the men inside were made by Bodle and Linder before the latter finally succeeded in placing a rope about the body of Mr. Caldwell by means of which he was brought to the surface. The entire time consumed from the moment the party entered the slope until Mr. Caldwell's body had been recovered was not more than 20 min. By this time, a large number of men had arrived from Blain City. Repeated attempts to reach the body of Mr. Stott failed, the gas barrier being seemingly impenetrable. Nearly three hours afterward, the rescue of the lone body was effected by a miner entering with wet cloths fastened over his face. Both Mr. Caldwell and Mr. Stott failed to respond to artificial respiration.



PHYSICAL FEATURES OF NO. 5 MANWAY

Several days later, mine inspectors visited the slope, took samples of the gas, and sealed the opening. An analysis of the gas, if such it may be called, shows the following parts of gases per hundred parts of the sample:

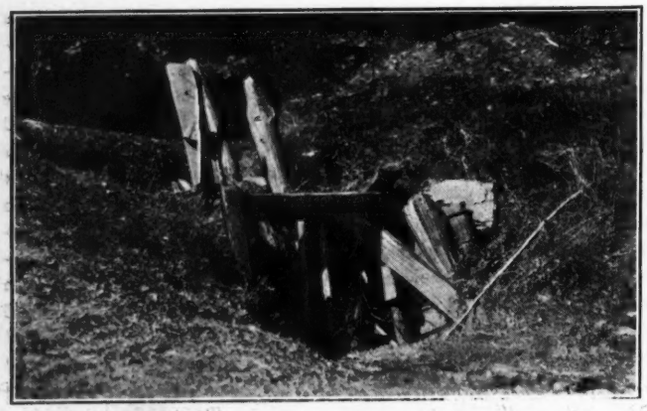
Carbon dioxide (blackdamp)	3.86
Oxygen	12.20
Nitrogen	84.94
Carbon monoxide (white damp)	Not present
Methane (firedamp)	Not present

Inasmuch as the sample was taken 9 ft. from the opening, 2 ft. from the roof, and without the aid of breathing apparatus, it may be assumed that the above quantities do not represent a true condition of the air that was encountered by the unfortunate men. In fact, a quality of air as represented by the above analysis would not cause death without giving the men warning in time to enable them to escape. However, certain conclusions can be reached as to the air mixtures that were responsible for the accident.

It is practically certain that the gas encountered, which was not diffused as may have been the sample, contained not more than from 6 to 8 parts of oxygen with a corresponding

increase in carbon dioxide. This would have given a heavier-than-air mixture which undoubtedly was present, otherwise the gas would have not collected at the bottom of the slope. The nitrogen value probably remained practically the same as that shown by the sample. It will be remembered that the sample was taken near the roof where the nitrogen value would have been highest, nitrogen being lighter than air.

Thus the substance that caused the accident cannot rightly be called a gas but rather an air deficient in oxygen. The effect of this air upon members of the rescuing party who were overcome at various times but revived substantiates the analysis report that white damp was not present. A black damp atmosphere, except in a highly concentrated state, would not have caused death as quickly as those reported. No after effects have been apparent on any of the men, although Mr. Rainer states that he occasionally experienced for some time a choking sensation. This no doubt arose from the severe mental and physical strain that he has been under, rather than any tangible physical discomfiture.



BARRICADED ENTRANCE TO THE SLOPE

A longitudinal cross-section of the slope as shown in the accompanying illustration will help to render more easily understood the conditions that were present at the time of the accident. The slope is approximately 80 ft. long, and at the bottom a raise is made that corresponds to the dip of the coal bed. A ditch leads away from the bottom and carries the collecting water to other sections of an adjoining mine whence it is pumped to the surface. During recent heavy rains, this ditch became clogged, with the result that the water not being allowed to escape, had risen nearly if not quite to the roof.

OLD WORKINGS ARE DANGEROUS

The air in the workings at the bottom not being subject to any system of ventilation had been undergoing a change for several years. It may be assumed that the coal left standing in pillars at or near the foot of the slope had absorbed considerable of the oxygen content from the air. The rise in the water then forced the air up the slope as shown in the diagram. The above mentioned condition is not a new one to mining men, as several accidents have occurred under similar conditions.

It would be unjust to criticize too severely the action of Mr. Stott and Mr. Caldwell in entering the slope without an open lamp for detecting the nature of the air. To them, particularly Mr. Caldwell, the condition of the opening was apparently known. This is the first time that water has ever been to the roof as far as records go. The whole catastrophe may be summed up as being another case of where the one chance out of a hundred prevailed.

The use of wet cloths in rescue work is neither to be commended or advised in air having a low oxygen content. The rescuer who used this method, himself admits that the cloths were utilized more for the purpose of excluding air than for forming any crude breathing apparatus. Water will absorb only its own volume of carbon dioxide, which places its value as a resistant at practically nothing. In white damp, wet cloths would be of no value, except for air exclusion.

Certain primary considerations should govern the investigation or entry of working places that have not been subject to ventilation for any considerable time. Of this the following —well known but often forgotten—will serve as a basis:

In entering an abandoned slope or shaft, an open lamp should be held in advance and at a level lower than the head. In entering an old working place, a mine safety lamp should comprise part of the equipment for the detection of any gas that may be present.

Legal Department

RIGHTS UNDER COAL LEASES—Suit, brought by a landowner to compel the lessee under a coal mining lease to make final account for royalties and to redeliver possession of the property to the plaintiff was properly dismissed where it appeared that the lease expressly provided that it should run until the exhaustion of all merchantable coal, and where it was shown that the colliery remained in full operation, and that, in addition to the pillars left by the lessee, several small parcels of coal remained "in the solid" yet to be mined. A supplemental agreement, granting an underground right of way for the removal of coal from adjacent lands, did not expire with the lease of the land across which the right of way extends on removal of all coal under the latter land, where the right of way was reserved under an express grant as follows: Full and free right to use "any openings or gangways in any vein of coal now opened or to be opened upon the leased premises, for the transportation of "all coal and minerals that lessees may mine from any other lands leased, owned, or to be leased or owned by" lessee, together with the right to construct and lay tracks and freely to use the same for such transportation "through any openings or gangways now opened or to be opened thereon" by lessee. That an increase in royalties and a lump sum payment of $1000 has been made by the lessee, in consideration of such supplemental agreement, supports an inference of mutual intention that the right of way should not expire with removal of the coal under the land across which the right of way was granted. Where a right of way is granted, without express limitation, it will be presumed that it was intended to continue during the life of the estate or interest to which it has become appurtenant. Therefore, until removal of the coal under the adjacent properties, or cessation of the right of removal, the right of way may be enjoyed. (Pennsylvania Supreme Court, Lillibridge vs. Lackawanna Coal Co., 107 Atlantic Reporter, 688.)

SHOWER BATH ACCIDENTS—Defendant established a bathroom at its mine, as required by the Oklahoma statutes, for the benefit of its miners. While taking a shower bath in the place, plaintiff, a miner, slipped in the basin and broke his arm. He sued for damages. Held, that before defendant can be held liable in damages, on a theory of negligent construction of the basin, it must be shown, either that the basin was obviously dangerous for use, or that it was constructed so different from the usual method of construction as to be dangerous. If the place was so constructed as to be reasonably safe for a person exercising ordinary care for his own safety, the defendant discharged its full duty to its employees. (Oklahoma Supreme Court, Taylor vs. Rock Island Coal Mining Co., 182 Pacific Reporter, 81.)

MARITIME LIENS FOR COALING VESSELS—Where a fuel company furnished coal to a tug on orders from her engineer, who had previously obtained coal while operating the tug for her owner, and the company was not informed until after the coal had been furnished that the vessel was being operated under a charter which required the charterer to furnish the coal, the company was entitled to enforce a lien against the tug. But this lien right was waived by the act of the fuel company in attempting to secure payment of the bill from the charterer, the bill being charged to the latter at the suggestion of the engineer. (United States District Court, District of Mass.; The Eastern; 257 Federal Reporter, 874.)

Oxyacetylene Process in Collieries and Shops—I

By Charles C. Phelps
New York City

The general shops, where most of the maintenance work is done are located in the center of the company's field of operations at Lansford, Penn. Formerly, practically all the work from the various collieries requiring oxy-acetylene treatment was done at this center, but now welding and cutting stations are also installed at the local shops which are located near the various breakers.

Local conditions, such as the nature of the repair, its urgency, the amount of work awaiting attention, etc., determine the routing instructions on each piece of work. It is the general policy to handle each repair job, whenever expedient to do so, near its point of origin. This practice saves considerably in transportation and handling charges and in time consumed, inasmuch as some of the collieries are many miles away from the main repair shop.

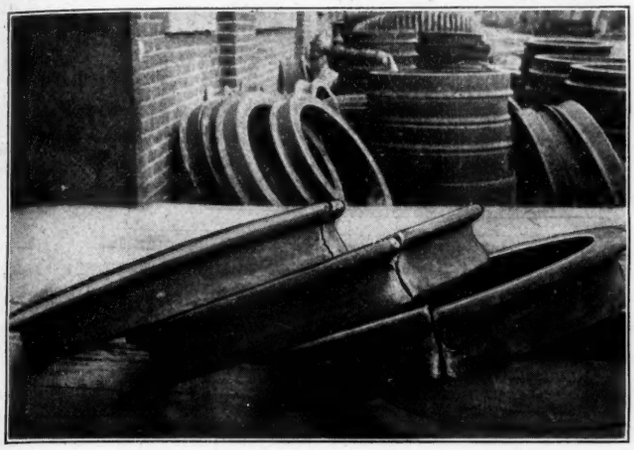


FIG. 1. REMOVAL OF TIRES FROM WHEELS

A large stationary Oxweld acetylene generator is installed at the Lansford shops and pipe lines radiate from it to the car-repair shop, the boiler shop and the general machine shop, the longest line being some two or three hundred feet in length. Six smaller stationary Oxweld generators are installed at the various breakers. In all, about 25 or 30 Oxweld welding and cutting stations are kept in operation at the various plants, most of them being located at the Lansford shops. Where possible, the work to be repaired is brought to a shop, which is provided with welding tables and preheating appliances. The job is taken to the apparatus and not the apparatus to the job.

This practice insures the execution of the repair under the most favorable conditions as to alignment of the work, preheating, etc. Of course, this is not practicable for some of the heavier equipment. The steam shovels and drills, for instance, which are employed in stripping operations are served by portable Oxweld acetylene generators, and cutting and welding equipment. Emergency crews, likewise, are fitted out with portable outfits consisting of a welding and cutting station, cylinders of dissolved acetylene and oxygen mounted on a two-wheeled hand truck.

Fewer Spare Parts Needed Where Welding is Employed.

With the exception of hammers and a few other forming tools, nearly all machine-shop tools are designed for the purpose of cutting or removing metal, hence the time-worn practical joke of calling upon the newest shop apprentice to produce the "putting-on tool." There is today, however, a true "putting-on tool," for in what better way could the welding blowpipe be described?

It rebuilds the worn places, it fills up cracks and blow holes and in a word it places within the hands of the artisan the power to form new shapes of infinite variety. Still more remarkable is the fact that the oxyacetylene "putting-on" process may be applied to practically any metal—wrought and cast steel and iron, copper, brass, bronze, aluminum, lead and many other pure and alloyed metals.

With the ability to build up metal at will to approximately any desired shape, the problem of maintaining a large supply of reserve parts is partly done away with. This is by no means the least of the advantages experienced by plants that make full use of the oxyacetylene process.

Frequently repairs are made at the end of the week at various plants of the Lehigh Coal and Navigation Co., and the repaired parts put back in place ready to function as usual upon starting up Monday morning, thus the repair does not delay production even for a moment.

Typical Mine and Colliery Repairs

Many repairs are of a truly urgent nature and it is not unusual for the welded part to start back to its destination before it has cooled. Sometimes even large parts are so hot that it is necessary to wrap them in asbestos and canvas for convenience in handling.

To record all the applications of the oxyacetylene process in shop and colliery would be like mapping the stars and anything approaching a complete statement of their extent could not be attempted in the limited space here available. From the very nature of the work, the operations vary from day to day and from month to month. Some idea of the scope of the work, however, may be gained by listing the jobs completed by a single operator during a typical month.

FIG. 2. FLAME AT THE FACE OF THE TREAD

The figures given in this list include the actual time consumed in preparing the work, setting up, chipping or grind-

ing, preheating when necessary, finishing, and other miscellaneous work connected with the above operations. Sometimes, for instance, it might require but two or three minutes to make a cut, whereas two or three hours might be charged up to the particular job.

Such an apparent discrepancy is explained by the fact that it might have been necessary to spend some time in removing and replacing guards, keys or bolts, or in moving the part from some distance or perhaps in going to the work and returning. In other words, the record gives the full time for completing each job and involves many factors.

The month's record, which is for the month of March, 1919, should therefore be considered in its entirety, as it would not be fair to single out individual items for purposes of comparison. Likewise, the descriptions of some of the jobs are

FIG. 3. CUTTING TIRE OF LOCOMOTIVE WHEEL

not complete, being based largely on the memory of the operator. Thus the time cannot be taken as exact.

A MONTH'S RECORD FOR ONE OXYACETYLENE OPERATOR

DATE	REPAIR JOBS AT LANSFORD SHOP	TOTAL HOURS
Mar. 3.	Locomotive repairs (miscellaneous parts welded)	5
	Machinery repairs (miscellaneous parts welded)	3½
Mar. 4.	Brake rigging welded, logging tractor piping welded and worn brake band built up by welding	3
	Heavy lathe face plate (2 breaks welded)	3
	Locomotive main driving rod of forged steel, broken in half, welded	1
	Welding rope shackle	1
Mar. 5.	Locomotive frame (break about 3½x3½-in. welded)	8½
Mar. 6.	Cutting steel for repairing locomotive parts	2
	Steam shovel crosshead shoe (cast iron), broken in half, welded	4
	Cutting off ends of projecting keys on breaker shafts	2½
Mar. 7.	Locomotive throttle valve (broken body) welded	1
	Pump cylinder (cast iron) break welded	3½
	Welding pipe and cutting holes	3

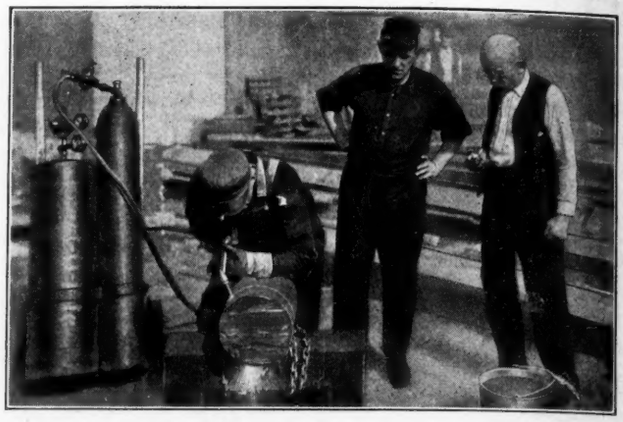


FIG. 4. CUTTING A 10-IN. SHAFT

	Controller handle (cast iron) broken in half, welded	1
	Dog for shaper, broken in half, welded	2
Mar. 8.	Cutting 12-in. forged steel shaft (2 cuts)	3
	Steam shovel parts welded	2½
	Removing sand holes in large new piston head by welding	2½
Mar. 11.	Parts of road scraper welded	4
	Cast iron pinion, break welded	3½
	Building up several new teeth on gear for briquetting machine	3
Mar. 12.	Stripped threads on lathe tool post holder,	

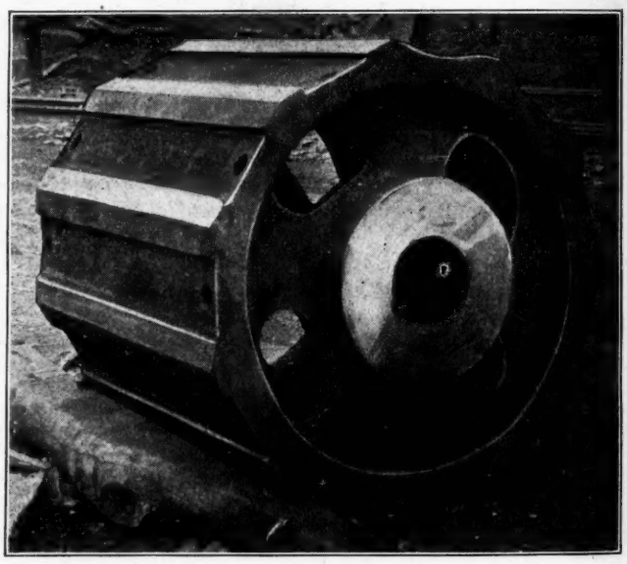


FIG. 5. VIEW OF MAIN CRUSHER ROLL

	built up by welding and retapped	1
	Cast iron pinion, break welded	3½
	Boring bar, broken in half, welded	1
	Pipe cutting	1
	Cutting off old stud heads and other locomotive parts	2
Mar. 13	Shaper chuck (cast iron) broken in half, welded	3

	Four locomotive wedges (which fit between frame and driving boxes) broken in half, welded	3½
	Rod for locomotive welded	3½
Mar. 18.	Hand oil pump part, welded	1
	Drill press rack broken in half welded	1

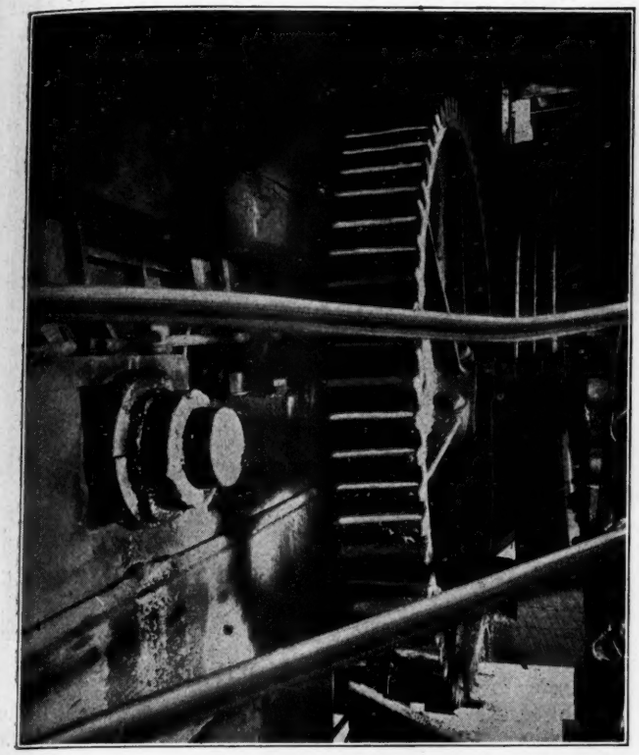


FIG. 6. DRIVING END OF CRUSHER

	Dodge auto parts welded	1
	Cadillac auto parts welded	½
	Pipes on locomotive welded	3
	Cast iron breaker clutch, broken, welded	2
Mar. 19.	Locomotive pipes, whistle, levers, etc., welded	3
	Steam cylinder, cracked longitudinally for 3 ft. from flange to flange, but flanges not cracked, welded	5½
Mar. 20.	Locomotive rod brass broken, new flange built up by welding	2
	Armature end shields (⅜-in. cast iron) cracked, welded	3
	Building up several new teeth on gears for boring mill	6
Mar. 21.	Locomotive fire door frame, 3 cracks welded and part of flange built up	4½
	Cast steel locomotive coupling, two breaks through bolt holes, welded	4
Mar. 25.	Locomotive boiler front frame and door cracked, (6 in. crack in ⅞ in. thick cast iron frame and 5 in. crack in ½ in. thick cast iron door) welded	4
	Thread nut for lathe, broken, welded	1
	Auto truck parts welded	3½
Mar. 26.	Boring mill gear casing (cast iron) 2 cracks 1½ ft. each, welded	3
	Clamp for key cutting machine, broken, welded	1
	Several repairs to ratchet jack by welding	3
	Brass valve plate from water end of pump, broken, welded	1½
Mar. 27	Packing nut on coal loader (end of nut, about 6 in. diameter broken off), welded	3
	Locomotive casting welded	3
	Locomotive journalbox welded	2½
Mar. 28.	Automobile door hinges welded	1
	Various locomotive welding repairs	5
	Heating with oxyacetylene blowpipe two ball bearing raceway rings, shrunk on armature shaft in order to remove rings about 8 and 14 in. diameter	2½
Mar. 30	Welding about 150 breaks in cast iron grids of large rheostat	5½

The above record covers only work passing through the Lansford machine shop. Outside of this building is a general metal storage yard and here the cutting blowpipe is frequently used for cutting up steel plates, shafts and various structural shapes.

Many steel and semi-steel mine cars are constantly undergoing repairs in the adjoining car shop. Car sides, braces, brackets, rivets, etc., require frequent replacement. It is extremely simple and economical to cut out the worn or corroded parts with the blowpipe and apply patches where necessary. Rivet holes are roughed out with the blowpipe and then reamed to the correct size. The work in this shop as well as in the boiler shop consists largely of cutting, and many Oxweld cutting blowpipes are kept in constant service there.

Following are a few of the typical welding and cutting operations described in detail:

Removing Steel Tires

The steel tires on locomotive wheels must be replaced after they have become worn. It is the practice with the Lehigh Coal and Navigation Co., to discard tires after the thickness of the thread has worn down to about 1½ in. and to replace the tire with one having a tread between 2 and 3 in. thick. Formerly, two different methods of performing this work were in use. One consisted in drilling a series of small holes in the tire and then fracturing it. This was often very difficult

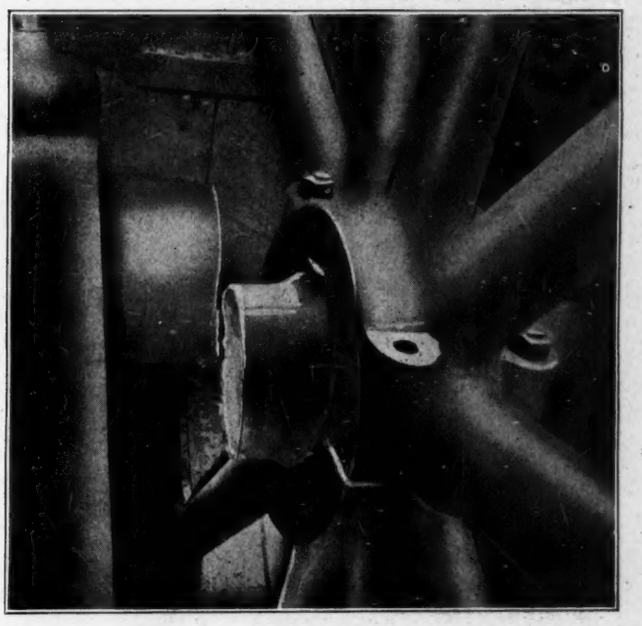


FIG. 7. VIEW OF CUT SHAFT

due to hard spots in the metal. The other method employed a special circular gasoline burner which was placed over the tire and by means of a series of small flames directed radially inward against the tire caused it to expand, whereupon it was slipped off the wheel. Both of these methods were expensive and slow, requiring from ¾ to 2 hr. per tire.

By the oxyacetylene method, which they now use exclusively for this work, each tire is removed in 2½ min. or less. Fig.

1 shows four tires 26 in. diameter, from "electric mules" (mine locomotives) which were cut in this way. The cut was started at the thinnest part of the metal, namely the crown of the flange (Fig. 2) and the flame directed horizontally parallel to the face of the tread. In this way the molten slag flowed out of the opposite side (Fig 3) and the tire was penetrated so quickly that no injury was done to the wheel, in fact the tire being still in tension as when first shrunk onto the wheel, generally snapped open before the cut had actually penetrated the full depth.

A somewhat similar application is the cutting of the hubs of two-segment steel gear and fly wheels. Many of these are cast in the company's foundry and in accordance with usual practice they are cast in one piece and broken afterwards, thus assuring perfect alignment of the two halves. Formerly the hubs were nicked with pneumatic chipping hammers and then broken by wedging. The operation is now greatly simplified and cheapened by merely cutting with the blowpipe, in fact the entire operation of splitting a large wheel is now completed in about a half hour whereas a full day was required for the work when it was done with pneumatic chisels and wedges, one man doing the work in both cases.

Cutting Shafts.

A question that is often asked is "What is the limit of thickness of steel or wrought iron that may be cut with the oxyacetylene blowpipe?" It is on record that metal as thick as 27 in. has been cut in this way, which goes to prove that the cutting blowpipe will accomplish any cut that in practice may be required of it, in the coal mining industry. Figure 4 shows a 10-in. shaft that was cut without any difficulty by the oxyacetylene process in just 6 min. It will readily be seen that there is no comparison between this speedy method and the slow usual machine-shop method of performing such work.

An interesting job of shaft cutting occurred at one of the Lehigh Coal and Navigation breakers. A piece of rock became wedged between two of the heavy main crusher rolls, badly twisting the driving shaft. Fig. 5 shows one of the rolls

FIG. 8. RIM AND HUB OF SHEAVE WHEEL

with the outer spiked segments removed. This is 3 ft. in diameter by 3 ft. in length and was mounted on a 6-in. shaft about 15 ft. in length. The keys that held the roll to the shaft were knocked out in an attempt to remove the shaft but it was found to be so badly twisted that the roll was gripped fast.

As it was inexpedient to dismantle the entire crusher at the time so it was allowed to continue running, without the keys, until the end of the week. The shaft was then cut off at both ends of the roll. Fig 6 shows the driving end of the crusher and gives an excellent idea of the very limited space available for conducting this operation. Fig. 7 shows a cut

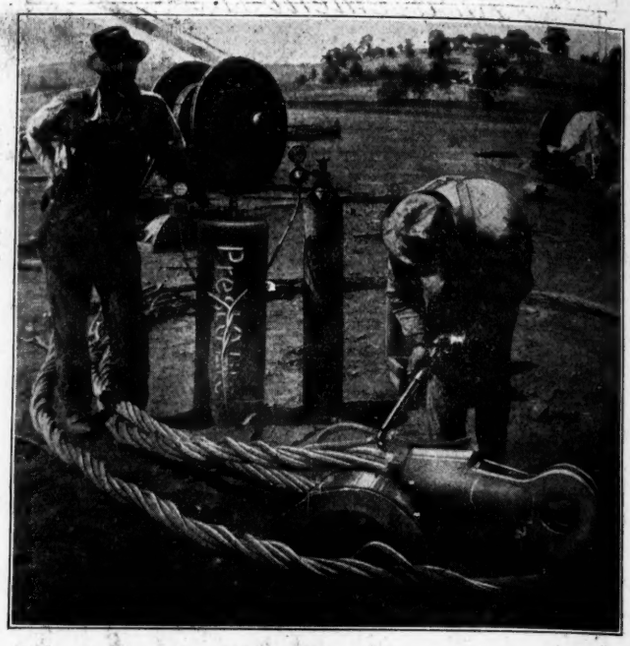


FIG. 9. REPAIRING WIRE CABLE

made under similar circumstances on another shaft. After the shaft was cut it was then an easy matter to lift the liberated roll out of its bearings with the aid of a chain block after which it was sent to the shop where the remaining section of the shaft was forced out of the roll with the aid of a hydraulic jack.

The actual blowpipe cutting operation required 18 min. on the driving side of the shaft and 13 min. on the other side. The work was started at 12:30 p. m. Saturday and at 6 p. m. the same afternoon the work of removing the roll had been completed, a gang of 8 men and foreman being employed on the job in addition to the oxyacetylene operator, whose services occupied the short period of time noted above.

Broken sheave wheel flanges are easily repaired by welding. Sometimes these repairs are made without removing the wheel, and when this is done it makes the operation of repairing extremely simple and economical. After sheaves have become worn or damaged to such an extent that salvaging by oxyacetylene methods is not profitable, it is customary to reclaim the spokes which are composed of good grade wrought iron and add them to the stock of bar iron. Fig. 8 shows the rim and hub of such a sheave wheel from which the spokes have been cut by the oxyacetylene process. The 36 spokes, 1⅜ in. in diameter, on such a 12-ft. diameter sheave are cut in this manner in about 30 or 40 minutes. It is necessary to cut only the outer ends of the spokes, the inner ends being merely nicked and then broken with the aid of a sledge.

Wire hoisting cables soon become weakened through wear, and the wisdom of resocketing or reclamping rope at regular periods is well recognized. There is no simpler and easier means of cutting such ropes than by means of the oxyacetylene cutting blowpipe (Fig. 9). The fact that the cutting flame must penetrate so many separate strands makes little difference in performing the operation. In timing this application of the process one operator required about 2 min. to cut through a new cable 2 in. in diameter.

(To Be Continued.)

MODEL RECREATION CENTERS

Scenes of the Amusement Hall of the Union Pacific Coal Co., Hanna, Wyoming

Morrow Explains 1917 Profits

In a letter addressed to Hon. Carter Glass, secretary of the Treasury, J. D. A. Morrow, vice president of the National Coal Association stated that Mr. Glass was misinformed as to the profits of the coal operators in 1917. He desired to be fair in his representation of facts and so did not use his own figures but quotes the reports of the United States Geological Survey.

Following is the letter as was received by Mr. Glass and made public Dec. 1, 1919.

Reluctantly I find myself obliged to take issue with an informal statement furnished you by some of your experts and published Nov. 27, regarding the profits of bituminous coal mine operators. That statment has given the public an impression so incorrect and misleading that I must call your attention to its obvious inconsistencies.

I feel sure that you did not personally weigh and test the statements contained therein, for I am confident that you wish to be fair and impartial, and a moment's consideration must have revealed to you the obviously erroneous impression certain to be created by the publication of the memorandum.

The memorandum is apparently based on a casual inspection of the returns of certain individual coal companies. From these individual instances the impression is clearly given that the industry in 1917 made "fabulous profits", with average returns on invested capital of "from 100 per cent to 150 per cent. It is true that the foregoing statement refers only to the operators east of the Mississippi, but they produce nearly 90 per cent of the total bituminous output.

Certain individual concerns may have made such profits, but not the industry as a whole, and, as the Fuel Administration has pointed out, fairness demands consideration of the industry as a whole.

For the entire bituminous industry in 1917 to make profits of "from 100 per cent. to 150 per cent. on invested capital, would require a total profit of upwards of $1,500,000,000. According to the United States Geological Survey Report, entitled "Coal in 1917," page 923, the total gross receipts of the operators for all the bituminous coal produced in 1917 was only $1,249,272,837. Hence the total gross receipts, before deducting operation expenses, were less than the total profits which would have to be made out of those receipts to justify the statement of your experts. This indicates the ridiculous nature of their casual generalizations.

The statement respecting the profits in 1918 is even worse. The memorandum says that in 1918 profits were generally "reduced 25 per cent to 30 per cent. less than for the preceding year". In other words, they must have averaged from 75 per cent to 120 per cent. This would mean total profits for the industry in the neighborhood of $750,000,000 to $1,200,000,000. Fortunately, on Nov. 19, the Fuel Administration issued exact information on this subject. It stated that for the year 1918 the average gross margin realized by the bituminous producers was 46c per ton, out of which "interest charges, selling expense, Federal taxes, both normal and excess profit, as well as certain other items not allowed in computing costs, were paid" before any profit remained. According to the United States Geological Survey the total production of bituminous coal in 1918 was just under 580,000,000 tons. A gross margin of 46c on this tonnage amounts to $266,800,000, most of which was not profit. This statement of the Fuel Administration was given to the newspapers, had been made public and attracted wide notice more than a week before your experts handed you their memorandum indicating that the profits in 1918 were from three to five times the total gross margin actually realized by the operators during the time that the United States Fuel Administration was exercising a careful and exact control of prices.

The Fuel Administration has emphasized the fact that general conclusions affecting bituminous coal selling prices can safely be drawn only from averages covering the entire industry. I know that you wish to be fair to this industry, as well as to all others. Therefore, as a correction to the memorandum of Nov. 27, I respectfully request that you publish the average percent. of profit on capital invested, both before and after paying Federal taxes, for the bituminous industry as a whole.

The Fuel Administration has also pointed out that a comparison of earnings of employees in this industry with earning of workers in other industries, is necessary to a fair consideration of wage problems. Likewise a comparison of profits in this industry with those in all other industries is necessary if you mean to set forth fairly the aspect of the bituminous coal mining industry. I must therefore further respectfully request that at the same time you also publish for the other industries their average percentage of profits both before and after Federal taxes have been paid.

In conclusion, let me add that this is asked not because it has any direct bearing upon the present wage controversy. For whether the coal producers can now absorb out of their profits large wage increases is to be determined, not with regard to conditions of two or three years ago, but with reference to present conditions. It is well known that in 1919 prices have been lower, costs higher and margins much smaller than in 1918, in many cases profits having entirely disappeared. Therefore, in asking for the publication of the averages suggested, this industry is asking merely for a simple act of justice to correct finally and effectively the erroneous public impression created by ill considered statements from those whose word carries the weight of authority.

Since I feel that this entire discussion should be open to the public, I am taking the liberty of handing this letter to the press.

1—The payment for diverted coal should, in all cases, be made to the shipper. For the purpose of such settlement the shipper shall be regarded as the party issuing shipping instructions, whether the producer, jobber or middleman.

("Where coal is consigned on the order of a jobber to a producer to be shipped to a customer of the jobber, the jobber is the shipper" and "the consignor of the coal is the shipper, unless the coal is consigned by the producer to a customer of the jobber on shipping instructions of the jobber.")

2—All coal shipped before Oct. 30, 1919, is to be paid for at the f. o. b. mine price at which it was sold by the shipper. Coal shipped before Oct. 30, 1919, which is claimed to have been sold for export, shall be paid for at the f. o. b.. mine price, at which it was sold to the exporter. Between Oct. 30 and Nov. 12, inclusive, it is not to be in excess of the maximum Government f. o. b. mine price.

(The sum of $1.35 permitted under the United States Fuel Administrator's order of Feb. 25, 1918, fixing prices for export and bunker coal may not be added to the f. o. b. mine price, either under a valid and enforcible contract, before Oct. 30, and after Nov. 12, inclusive, or to the maximum Government price between the two dates mentioned. The Fuel Administrator rules that coal cannot be classified as export coal, except when actually loaded into foreign vessels, and only after the coal has been so loaded.)

3—All coal shipped on and after Oct. 30 and until and including Nov. 12, 1919, shall be paid for at not exceeding the maximum Government price at the mines, unless such coal is, at the time of diversion, moving to a purchaser from a jobber, in which case a jobber's margin of 15c per net ton may be added.

4—All coal shipped on and after Nov. 13, 1919, under a valid and enforcible contract, made prior to Oct. 30, 1919, shall be paid for at the price provided by the contract. All coal shipped on and after Nov. 13, 1919, not covered by a valid and enforcible contract, shall be paid for in accordance with Rule No. 3.

5—The order of Oct. 31, 1919, restores the order of Jan. 14, 1918, as amended by order of Nov. 20th, 1918, which cancelled the 15c rebilling charge. Therefore, the 15c rebilling charge is not a proper item of settlement on coal diverted on or after Oct. 30, 1919.

6—Proof of the contract price between the shipper and the original consignee should be established by requiring a certified copy of the shipper's invoice, and if claim is made that coal was not shipped on contract, and the Government price is demanded, a certificate or affidavit should be required from the shipper to that effect.

7—Date of shipment is the date on which coal has been delivered into possession of the railroad as common carrier, and price is determined as of that date.

Coal Financing Plan

The American Wholesale Coal Association through George Cushing, its managing director, has been laboring with the Railroad Administration in an effort to arrive at some agreement whereby the operators may be paid for their coal in order that the money which is due them may be used to pay the wages of miners who are at work in the mines. Mr. Cushing announced lately that the Railroad Administration has agreed to pay part of one bill of $34,000, leaving unpaid bills for nearly $50,000,000.

The Central Coal Committee later made the statement that if any wholesalers or operators who had not been able to collect from regional committees for coal taken, would present their bills for such coal to the chairman of the finance committee of the Central Coal Committee at Washington, they would secure prompt payment.

Following this cheering statement, advice was received from Washington that the Railroad Administration refused to carry out arrangements made with the Coal Committee. The question of payment for these coal shipments still

loomed large until a new plan for prompt settlement of claims against the railroads was adopted by the Railroad Administration and Federal Reserve Board.

Under this plan, upon the delivery of coal to the railroads for shipment, the coal company will issue a special draft which will be eligible for rediscounting at the Federal Reserve Banks, thereby preventing the accumulation of claims against the carriers of payment of coal diverted in transit from the original consignee.

Bureau of Mines Appropriation for 1920 Provided For

Appropriations totaling $2,592,920 and $1,655,880 are provided in the annual estimates for the Geological Survey and the Bureau of Mines, respectively. The money is to be expended during the fiscal year ending June 30, 1921. While a considerable portion of the work of the Geological Survey has a bearing on the coal industry, the items of more direct interest are as follows. Special statistical compilations on the production and distribution and consumption of essential minerals, including coal, $200,000; survey of power production and distribution in the Boston-Washington industrial region, $250,000.

Most of the Bureau of Mines' work applies directly to coal. Some of the items asked by the Secretary of the Interior for the Bureau of Mines are as follows: Investigating mine accidents, $454,000; testing of fuel, $175,000; scientific and technologic investigations with the view to increasing safety, efficiency and economic development in mines, $250,000; operation of mine rescue cars, $180,250; purchase of new mine rescue cars, $40,000; inspecting mines in Alaska, $7,000. In addition, the Bureau of Mines has jurisdiction over the Government fuel yard which is conducted with a revolving fund of $1,000,000.

Investigation of the condition and methods of use of scales and mine cars used for the weighing and measuring of coal dug by miners, and for the purpose of determining wages due, and of conditions effecting the accuracy of the measuring or weighing of coal at the mines, by the Bureau of Standards during the next fiscal year, will call for an appropriation of $25,000, the Director of that Bureau reports. This is an increase of $10,000 over the appropriation for this work during the current fiscal year. The work is under the immediate direction of an inspector of weights and measures at a salary of $3,300. Others employed in this work are: an associate engineer at $2,100, an assistant inspector of weights and measures $1,920, two assistant engineer-inspectors at $1,800, an assistant physicist, $1,680, an assistant inspector of weights and measures at 1,500.

Coal Shortage May Reduce Canadian Consumption

In view of a threatened coal shortage in this country this winter, Canadian importers have speculated on the possibility of getting their supply from the Nova Scotia bituminous coal centers. There is a strong feeling, however, in Canadian manufacturing centers opposed to the quality of the maritime provinces coal, and it has been reported through official channels that it is doubtful whether such a change will be made.

In addition to the superior quality of bituminous coal from certain American districts over the Nova Scotia bituminous coal, freight charges from Nova Scotia are reported to be unusually high, and manufacturers in Quebec have found it more profitable to use American coal. The quality of bituminous coal from Nova Scotia, according to a report, would not relieve the domestic heating problem in Ontario.

Despite the warnings that have been sent by the transportation department of the Canadian Manufacturers Association to all users of bituminous coal to secure their supplies as soon as possible, it would appear from the comparative figures on the importations of bituminous coal in Ontario that the users of this coal were well supplied.

The importations of bituminous coal between April 1 and August 31, 1916, according to customs returns, were in round figures 3,500,000 tons. In the same period in 1919, the importations amounted to 3,300,000 tons in 1917, 4,850,000 tons; and in 1918, 5,350,000 tons.

The large importations of 1918, with the sudden ending of the war and the closing up of many industrial plants, would lead to the conclusion that large quantities were on hand this year.

New Adjustment for Railroad Rates Sought

In their efforts to stablize conditions in the coal mining industry the representatives of the operators and the miners are more determined than ever to work for an adjustment of railroad rates which will make possible a greater price inducement to the consumer for the purchase of coal during the spring and early summer. The operators express themselves as being willing to go further than ever before in the matter of price concessions so as to make it possible to operate mines more nearly on a year around basis. It is believed that from the present conference will come concrete recommendations which, if put into effect, will do much to permit of operation during the season of lightest demand. Assurances of coöperation to this end have been received from the Railroad Administration. While the Railroad Administration soon will be a thing of the past, it is believed that a plan can be worked out with the individual companies, all of whom are interested in flattening the peak load which they are called upon to carry in the early winter. It also is believed by spreading coal transportation over the entire year that important savings can be effected in the purchase of open top equipment.

Another matter which is being given very careful consideration in connection with the adjustment of the labor troubles is the matter of coal storage. Since it is manifestly of little advantage to store coal at the mines, the problem resolves itself into making it to the advantage of consumers to provide storage facilities. No concrete plan has been worked out as yet, but it is expected that this matter is to be brought forward in a way which is likely to have important results.

Ventilation Problems to be Investigated

Complying with numerous appeals from engineers throughout the country, the Bureau of Mines has asked Congress for $100,000 to investigate ventilation problems in connection with the construction of vehicular tunnels. The work that the Bureau has done in connection with ventilation and the study of poisonous gases in coal mines qualifies it particularly for this work. It is believed that the study in this connection which is to be made in coöperation with Yale University will lead to results of value to the coal mining industries. At present, vehicular tunnels are under consideration at New York, Chicago, Pittsburgh, Boston, San Francisco and New Orleans. It is feared that the carbon monoxide developed by the many automobiles which will use these tunnels may be sufficient to menace life.

COAL AGE

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Last Combined Number

IT IS A CAUSE of much congratulation that we publish herewith the last combined number of *Coal Age*. Our next issue that of Dec. 25, which will appear Dec. 29, will be a regular number, so we shall start the New Year as New Years should be started—with new resolutions.

Our readers, have borne nobly with our delays and with the measures we have taken to remedy an unfortunate, but unavoidable, situation. Their kindly letters of interest have sustained us at times the most trying that can come to any publishing house.

We are endeavoring to overcome the difficulties that still confront us. If, for a while, we do not maintain all our past efficiency, and the paper does not have all its former excellencies, kindly credit us with a knowledge of that fact and a desire to attain and surpass what we have done in the past. None of the "letting down" will be observable when the pressure of the strike has entirely come to an end.

Every publishing house fits its printing capacity to the number of periodicals it is publishing. When there is an enforced delay in publication, on resumption either more copies must be published each month or else combined issues are made necessary. The McGraw-Hill Co., has used both expedients—a slight acceleration in issue and combined numbers. It is clear that both these handicaps no well-adjusted shops can meet satisfactorily.

In short it is not possible to set all the material for all the papers in our own establishment or to print the material when it is set. For this reason the papers are as yet, not all gathered under the family roof tree. Some day soon *Coal Age* will be home again and printed by our own employees and under the eye of our entire editorial staff. Then every editor will, with his accustomed zeal, guard the printing of what he has prepared. Till then we plead for patience and for a further exhibit of that good will which our readers have so generously exhibited toward us.

Low Prices and Idleness

DR. GARFIELD ASSURES us that his 14 per cent increase with prices unchanged will put out of business mines producing 100,000,000 tons of coal a year. This suspension of industry will, be severe on capital, it is true, but he is probably as unmoved by that fact as most people are by the losses incurred by capitalists, small or large.

However, he has nothing to say about the effect of his order on the workingmen who have been engaged in those mines the operations of which may, or must, now be suspended. The laying off of 100,000 men is no small matter. Many of them will move themselves, their families and their household property. If they have houses they must abandon them. Their dwellings cannot be sold, for the community in which they are living will be completely ruined by the fuel order.

But many men will not move. Some are too old to take up life in a new town, some are too closely wedded to the old community, some are parasites, or partly parasites, of the parental home and some rather than move will continue to try and eke out a poor living—far poorer than mining affords—by working on the farms, on the roads, at clayworks and like industries. Some will work part of the year elsewhere and return home for a few months every so often.

The outcome will be hard for them. The past irregular work in the mines looked at from the experience of the future will be a happy memory rather than a bitter one.

Fortunately it is likely that Dr. Garfield's order will not be as harmful to workingmen as his statement would indicate. The operator is a persevering and optimistic person. Like Mr. Micawber he persists in "looking for something to turn up". Some will see ahead to the end of the war and to the consequent removal of the restraints of the Lever Act. When that time comes they will be able occasionally to charge what they find necessary or even a bigger price, if the demands for coal continues as it undoubtedly will. They want to keep their men together till that time.

Besides the operator is apt to remind himself that if he closes his mines he will be idle at a loss and that is worse than working under a like condition. There will be maintenance charges to be met in any event. He will urge on himself that it is better to lose a little money working than to lose as much or more lying idle. The practice of working at a loss which the Federal Trade Commission under E. N. Hurley condemned will be resumed. Some of the mines will work irregularly and unprofitably, and the mine worker's exeperience will be unusually bitter.

Raw Material and Products of College Life

NO ONE CAN CONCEIVE what kind of iron and steel we would produce if the iron masters did not specify what tolerance limits they would demand in the coke, iron ore and limestone shipped to their furnaces. And who shall say what would happen if the manufacturing public and the railroads would receive without protest any and all iron and steel offered by the steel companies regardless of quality?

Foolish indeed is the suggestion just made. No business man would abolish specification and inspection. Yet college professors build large institutions on this basis. There are specifications for the building, the fixtures and the faculty, but for the raw material to be smelted in the furnace of the educational establishment no specifications are written. The faculty welcomes all comers, those mentally unfitted for the work for which they are to be trained and those without a proper brain equipment for any professional or executive position whatever.

The college professor is bidden to seize avidly all the students he can induce to attend his college. He has no standards except perhaps as to the moral character of his charges, and the degree of preliminary training they have received. He does not examine the inwardness of the student. It is as if the purchaser of coke saw that the coke was really devolatilized coal and knew that it had passed through one of several types of ovens, but did not query whether the material was low in sulphur and phosphorus.

Until colleges sort out the offering material and take only the best, they will fail as ignominiously in satisfying the public as the operator would fail if he kept every man

offering and raised his position and emoluments year by year as he advanced in seniority. Too often there are basal defects in the material.

Fortunately for the Carnegie Institute of Technology it is seeking to have the mining public select the men for its academic treatment. It is not running all kinds of human ore through the mill but only that which seems likely from previous expert inquiry to be capable to serve the purposes sought.

Perhaps the public prefers the wasteful way of the colleges and is willing to see them take all offering material, pay ore and other, and treat all natures alike—but it may be necessary to stand at the feeder and select what is good material beneficiated and reject all material that was not from the first good enough for beneficiation.

Tit for Tat

EARLY IN 1919 the public declared that prices of coal should come down about 60 per cent and that the mine workers' wages were higher than they should be. For this reason the mines were idle. There was in short a buyer's strike, from which the mine workers and the country suffered.

Near the close of 1919 the mine workers, made angry by the lengthy idleness in the early part of the year declared they must have a 60 per cent increase to make up for their irregular employment.

Coal Age in the spring of this year said that the mine workers were in a mood that would make a strike and a big demand for a wage increase and shorter time almost inevitable, and the public by not buying was preparing itself for an uncomfortable disillusionment later.

The disillusionment came. The strike was declared, and only the determination of the public to prevent an excessive wage increase prevented the mine workers from having their way. Now everyone is trying to claim that the fault for the idleness did not lie with them.

The Fuel Administration, the Geological Survey, the National Coal Association, the operators and mine workers can prove that they were not to be blamed for not having forewarned the public of the possibility of a coal shortage. The same cannot be said of the United States Railroad Administration, of some members of Congress such as Representative or of the public generally.

They declared the attempts to awaken the public to a sense of its duty and danger was a malicious conspiracy to brisken the market needlessly. As a result the campaign of the National Coal Association costing, it is said, $80,000 failed to produce the whole effect desired. However, much good work was done. Had it not been for the Association's activity in informing the public of the situation the Bolshevism would have been more general, the demands might have been even more unreasonable and the outcome to a nation, entirely without coal stocks, more severe.

A New Departure

IN THESE DAYS there is plenty of publicity, but it is all of the wrong kind, for like is talking to like and no progress is gained when that is the case. The workingman takes his daily paper which usually caters to his unrest, while the employer reads his business papers, which are too often largely devoted to playing up the employer's point of view. The employer, however, is unusually fortunate in that he reads the daily press, which in normal periods is apt to favor the employed rather than the employer, the bulk of the readers of newspapers coming under the former description. As a result, though his feelings are occasionally outraged, he really does learn the point of view of the employed and is broadened thereby.

But the employee reads nothing but newspapers and his union organs, and they carefully foster his unrest. They like to blazon forth headlines which arouse his interest as a red rag draws a bull. It is needful that the workingman be led to see the other side as, he in part, did during the war, when the four-minute men, Government officials and Government propaganda filled the land.

Coal Age knows that its readers are not in any way infested with the germ of the Bolshevik fever, and that as a journal it cannot meet the needs of the Red situation. It can, by editorials, correct in large degree the unrest which spreads in most unlikely places, finding a congenial home in Washington and in the hearts of men of some authority and intelligence elsewhere, but it cannot reach the Bolshevik—the man who would end all in a vain attempt to get his visions made realities.

These must be reached by posted notices on buildings where the persons to be addressed continually pass or stop. *Coal Age* expects to run, in the lower right hand corner of its second editorial page, anti-Bolshevik and similar propaganda. These posters it expects to set up in somewhat larger type (so large in fact that they will be page size or larger) and to distribute them to its readers free, or at cost price, according to number, to those who write for copies. *Coal Age* will also be glad to have them printed in the form and size in which they appear on the page. Furthermore, if it appears that there is a fair demand for any given editorial, it will be glad to have reprints made for distribution at cost. Some of the editorials may need the rewriting of a few words to make them more suitable for general distribution, and that change will be made.

The Reds Promised Well, But This is What They Did

A British officer writes to his wife:

"I hope to send you copies of sixty-four official photos taken by British officers at Odessa when the town was retaken. . . . They show men who have been crucified with the torture of the human glove. The victim gets crucified, nails through his elbows. The hands are treated with a solution which shrivels the skin. The skin is cut out with a razor round the wrist, and peeled off, till it hangs by the finger nails—the 'human glove.'

"Most of the photos are of women, women with their breasts cut off to the bone, women with their bodies cut open."

The Socialists promise great things and demand much, but if they win they will rule; and what then? We shall not care then what they preach but what they do. Are they good men in their family and in the community? Will they be good then or will they be like the Russian Reds?

DISCUSSION *by* READERS

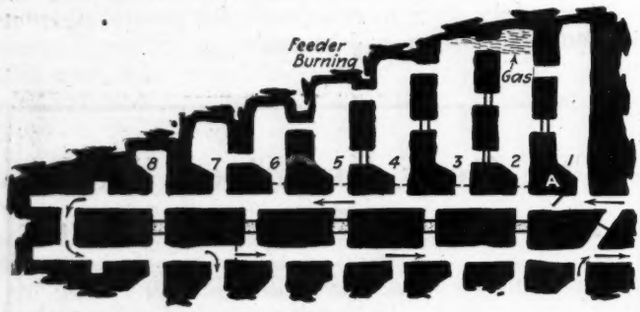
EDITED BY JAMES T. BEARD

Finding a Mine Door Set Open

Letter No. 11—Much credit is due Richard Bowen for the question he has raised in regard to the manner of proceeding if a fireboss finds a door set open when beginning his examination of a mine. Mr. Bowen should receive the thanks of all good firebosses, many of whom will be benefited by this discussion.

My experience tells me that any short-circuiting of the air, such as is here suggested, will be at once detected by observing the water gage, a thing that every fireboss should do before starting to make his examination. Any decrease in the reading of the gage will indicate that either the fan is not running at its regular speed, or the air is not traveling in its customary course through the mine. It may happen, however, that the standing open of a door controlling but a small section of the workings, as illustrated in the figure presented, will cause such a slight decrease in pressure, as to be unnoticed and the fireboss will discover the open door only when he has reached the place.

In that instance, a man with practical judgment will know what to do at once. He will let the door stand open and, following the air, will examine each place and make sure that everything is safe, before closing the door. Should



he find anything wrong, he will then decide the best course to pursue. Assuming, however, that a man of less practical experience finds a door standing open when he is about to begin his examination, the chances are that he will close the door at once and wait until the circulation has been restored, which as Mr. Bowen has said would probably bring disaster.

In the discussion of this question, some will claim very rightly, that such a condition as is here presented will only be found in a poorly managed mine. It is true that, in mines where shots are fired at quitting time, a firerunner should follow the course of the air after allowing a short interval of time for the smoke to clear. It is the duty of the firerunner to see that no fire has been started, in any place, by the shooting. In mines where no firerunner is employed, it will frequently happen that a fire started by a shot is discovered too late, after it has gained much headway and a whole section of the mine may be endangered. Many disastrous explosions can be traced to such a course.

It should be remarked here, that the arrangement shown in the figure presented by Mr. Bowen is not adapted to the ventilation of a gassy mine, since the air circulating through the rooms on the right must pass through the rooms on the left, before reaching the return. A safe method to adopt in the arrangement of a mine that is generating much gas, is to provide a triple-entry system and conduct the air from each set of rooms at once into the main return.

In respect to starting the examination of a gaseous mine, my practice is to follow the air current, beginning at the intake end, which I believe is the only way to locate a possible short-circuit of the air quickly and safely.

The suggestion that should a fire be burning in the section it will be reached in time whether the start is made at the intake or the return end of the section is not very clear to me. My opinion is that when one starts at the return end of a section in which the air is short-circuited and a fire burning at some point, there is danger that the examiner will be overcome by the smoke or gas before reaching the mine. This, of course, is more applicable to a larger section than that illustrated in the figure.

Peru, Ill. GASTON F. LIBIEZ.

Letter No. 12—An experience of ten years firebossing, in very gaseous seams in the Wyoming Valley, leads me to say that the condition suggested in this discussion is one that a fireboss does not want to meet with very often. In many of the Anthracite mines, the finding of an open door suggests a bad condition and causes the fireboss to proceed with the greatest caution, particularly if there is a possibility that the air has been short-circuited eight or ten hours, which fact he has no means of telling.

Speaking practically, I have always proceeded by way of the intake, following the course of the air, not because technical books say so, but for other reasons. For instance, on entering the section by the intake, a fireboss will quickly observe the quantity of air passing and know whether or not the circulation is deficient in volume. If the usual quantity is not going, the fireboss is at once on his guard and observes closely every door and brattice. Being familiar with every inch of the ground, he goes directly to those points where he thinks the air may be short-circuited. Not finding any trouble at these points, he will naturally assume that the slack air is due to a fall on the return.

Where the three main-door system is employed, there is always a certain pressure on the door and the fireboss, by observing carefully and listening, can readily detect if that pressure is diminished, in which case he will again be on his guard from the time he enters the intake of his section. Again, when entering a section by the intake, the fireboss, on observing the first indication of gas in a place, will generally be able to form a better conclusion in respect to those points where danger may exist, than if he detected gas when approaching the place from the return end of the section. Observing the brattice in good condition, he examines carefully for any feeder in the coal, or slip in the roof from which the gas may come. It may arise however, from an abrupt change in the pitch of the seam or other cause, but its presence makes him doubly cautious.

Proceeding thus with the air and observing a gradual increase in the size of the flame cap on his lamp, the fireboss

is warned of his approach to a dangerous atmosphere; but his chances to retreat to safety are more satisfying than if he was traveling against the current, which would be the case if he had entered at the return end of the section. Approaching a dangerous atmosphere from the return end, a fireboss must promptly extinguish his lamp and withdraw in the dark; but when approaching on the intake side he needs only to lower his flame and withdraw to safety.

Referring to the geological conditions being such as to favor starting the examination at the return end of a section, Richard Bowen advances that as a reason for such procedure, "Coal Age", Sept. 11, p. 462. I have known some men to hold the same view though they were practical mining men. Hundreds of times men have made examinations beginning at the return end and found nothing wrong, while at other times they have been compelled to withdraw after going but a few hundred feet. Finding themselves much weakened, they realized that something was wrong and retreated, reaching safety, panting and excited.

I recall one fireboss who was accustomed to jump into the return and hustle along. On one occasion, however, he was halted by the smell of burning canvass and compelled to withdraw and enter by the intake, before he could approach the scene of the trouble.

THE TEXT BOOK VERSION

Technical mining books always say that it is safer to approach a body of gas on the intake side rather than on the return side, claiming that the liability of explosion is lessened. The main point, however, is that if a man falls in a weakened condition on the return side of trouble he is likely to stay there until rescued; but if he falls on the intake side, the chances of his being revived with fresh air are fairly good, since the fresh air almost invariably travels along the floor. On reviving, the man is able to crawl back to safety.

Now, assuming the conditions illustrated in the figure presented by Mr. Bowen, it appears that an open door has short-circuited the air and gas has accumulated at the face of Chamber 2, while a gas feeder is burning in Chamber 5. Common sense tells us that to close the door would soon result in an explosion. Instead, therefore, the fireboss must proceed with caution and seek to find how much gas has accumulated, making frequent tests as he moves up Chamber 1.

Having gained some idea of the volume of gas present, he withdraws to the entry and proceeds to examine the remaining chambers to ascertain their condition. Only after extinguishing the burning feeder and assuring himself that there is no fire in the remaining portion of the section, can he safely close the door and restore the circulation

One thing every fireboss must remember is that it will frequently happen, in making an examination and finding a large body of gas lodged at the face of a pitch, the closing of a door will retard the circulation for a time. At this juncture, one must not get excited, but wait patiently for the air to mix with the gas and for the ventilating pressure to force it out.

At times, the entire current may be checked and recourse must then be had to other means before the gas can be removed. It may be necessary to increase the quantity of air delivered to that section. Even after the gas has been removed, the entire section must be examined again, in order to make sure that the working places are safe for men to enter. This is one of the requirements of the Anthracite Mine Law.

Edwardsville, Tenn. LEWIS R. THOMAS.

Promotion of Eager Workers

Letter No. 3—In reading the interesting letter of Richard Bowen, "Coal Age" Oct. 9, p. 628, I notice that he takes some exception to the ideas I expressed in a previous letter, regarding length of service as being a factor in deciding promotion. Mr. Bowen has seemingly misjudged my position in this matter.

It was far from my intention to convey the meaning that seniority, or length of service, should alone determine the question of the promotion of an employee. I much regret that my letter conveyed this impression. The illustration I gave was calculated to show the disappointment felt by an old employee who had qualified himself for promotion, passed the examination, and secured a first-class mine foreman's certificate.

Let me say, here, that length of service should only be considered in connection with the fitness of a man to fill the place in question. An old employee who can pass the examination and is qualified for the position should however, in my opinion, always be given the preference over a new man who may have equal qualifications.

It is true, as Mr. Bowen has pointed out, that there are always men who labor with their hands and do not use their brains, but depend on their length of service to win for them the desired promotion. I regard such men as being the least fitted for advancement. They are anxious to fill positions of trust, because of the honor and respect due the higher position.

Coal mining, let me say, is not a game for amusement and cannot be learned in a few short months; it takes years of continued effort, both by study and labor. The man who puts aside his books and papers when he has secured his certificate will never make a good foreman. He must continue to study and read in order to keep himself abreast of the times and be able to handle successfully the various problems that arise each day in the mine.

It is my desire to emphasize the injustice done old employees who are equally qualified with the new men who so frequently are given desirable positions through favoritism. Such action on the part of a management discounts all the loyalty, all the effort of old employees who have rendered years of faithful service. Disappointed and discouraged, their ardor dampened, they are unable to show the same enthusiasm in their later service.

It is this condition that leads good miners to quit the mine for work in other industries. Many a miner has lost his ambition for the work he has followed all his life, and is anxious that his boys shall find other work than that of mining coal.

My thought is well expressed in a verse by R. T. Strohm, which appeared in "Coal Age" Vol. 10, p. 869, and reads as follows:

Nothing kills his high ambition
Quite so thoroughly as when
He observes advanced positions
Go to new and unknown men.
So you really cannot blame him
If his spirit's dull and dead
When you don't intend to name him
For the better job ahead.

Let us hope that managers, superintendents, and foremen will, in the future, lay more emphasis on the seniority rule when considering the fitness and qualifications of men for advanced positions of trust and responsibility. It will go a long way in retaining the services of competent mining men.

Altoona, Ala. JOHN W. JONES.

Letter No. 4—This subject will surely stimulate an active interest among all ambitious workers, especially those who allege that the proper recognition has not yet been accorded them for their fidelity and faithfulness in service. Mention has been made by previous writers of partiality being shown by the management toward their personal friends, and the ambitious worker is said to be lost to sight in the shuffle. It is even urged that the length of service of faithful workers is not properly recognized

In this connection, let me suggest that the first point to be considered is whether the worker is really ambitious; or is he merely a faithful, steady worker like so many of the rest of us, who are compelled by necessity to labor. It may chance that the mental energies of many so-called ambitious workers are mostly idle dreams of future leisure.

Again, let me ask: Is the worker's ambition founded on substantial principles that stand for success, or is his work limited automatically by the clock? We must remember that it is faithful and intelligently directed work that wins recognition and promotion. The boss is watching the workers, either for the purpose of learning who are best fitted for advancement to positions where their services will be of more value to the company, or to find an excuse for laying off those who are not profitable workers.

There are, of course, hundreds of workers who are performing valuable service, and yet are not ambitious. However, we are at present concerned in the ambitious worker and striving to find the real source of his ambition, in order to determine what merit he possesses that makes him a fit subject for promotion.

HOW ABOUT TOOTING YOUR OWN HORN

A truly ambitious worker must keep in mind the necessity of aligning his ambitions with the interest of his employer. The ambitious worker may have the proper capabilities for filling a higher position, but he must be able to show his capacity in that direction and so deliver the goods that his employer will see his fitness for higher service. The worker may be faithful, loyal and have a certain amount of ambition; but, through lack of contact with him, his employer may remain wholly ignorant of the man's qualifications. In that case, no one is to blame but the man himself when the promotion goes to another, because the superintendent or foreman was not aware of his ambitions, as remarked in a previous letter. One of the great secrets is to make one's ambition known.

Loyalty goes hand in hand with true ambition. I have seen road and ditch cleaners give their attention to an insecure piece of rock, in time to prevent a serious accident or delay, by a fall of roof blocking the road. I have seen them give their attention to leaky stoppings, open doors and other hindrances to good ventilation. By such acts they have shown their loyalty and ambition to perform faithful service.

There are other steady workers, but who never step aside from the line of work in which they are engaged at the time. Their ambition, if they have any, is to be at the shaft bottom when the whistle blows. One can readily judge of their value to the company, as compared with the tracklayer or shifthand, who puts in a little overtime in order to finish his job, that night, in order that there may be no delay the next morning. Unconsciously, it may be, such a worker makes known his ambition by his loyalty to the work.

Many a worker believes that he has real ambition and should be crowned with success, but they are often merely calamity howlers and knockers. Should it happen that someone of their fellow workers is shoved ahead, they do not fail to proclaim the injustice done them so loudly that a few of their fellows are led to believe their claim and sympathize with them. Men of this class are quite versatile in telling their fellows how a thing ought to have been done and explain how, in their opinion, the mine could be made one of the best producers in the country, but none of their ideas are offered to the foreman, who has learned their worth and has a correct estimate of their ambition. A competent foreman knows there are many ways in which the truly ambitious worker can show his ambition and it is up to the worker to do this.

Thomas, W. Va. MINE WORKER.

Letter No. 5—This question of promoting an ambitious worker is one of considerable importance to the organization of a coal-mining company, or any other industrial company for that matter. It brings to my mind, an incident that took place more than a quarter of a century ago, when I was a young man of about 30 and engaged as an assistant foreman at the colliery of a large mining company.

The number of openings at this colliery were increasing continually, and it was apparent to me that the work would shortly be divided and another foreman appointed to take charge over a portion of the rapid development. While I was right in this conclusion, a disappointment was in store for me as the appointment of another foreman went to an outsider who was a personal friend of the general superintendent

In this case, it must be admitted that the new man was exceptionally capable and well fitted to fill the position. The fact of the matter was, as I willingly acknowledged a few years later, my direct association with this man was of the greatest help to me in learning many things with which I was not familiar. I realize now, that the appointment of an outsider, in that particular instance, was a blessing to me, as I gained more than I lost.

QUALIFICATIONS SHOULD BE KNOWN

It is stated by Fairplay, in his letter, "Coal Age," Aug. 28, p. 375, that the superintendent, in the instance he cites, did not know that the man (who was disappointed by not receiving an appointment as foreman) was an applicant for the position. Certainly, there was something wrong there, either with the man or his superintendent. In my view of the matter, a superintendent should be in such close touch with his men that he would be fully acquainted with their ambitions and aspirations. It is true that this man may have been uncommunicative and was himself to blame that the superintendent did not know of his desire for promotion.

It frequently happens that, in large organizations, many misfits get into good positions through friendship, relationship or some religious or political influence. I recall an incident that occurred a few years ago, at one of the largest mines in this valley. Owing to a change in management, an order was issued that no foreman would be permitted to have a relation of his employed directly under him.

It so happened that a foreman of this company who was in charge of a large and important colliery, in an isolated locality, was directed by the superintendent to lay off his only son and direct him to report to another colliery some four miles distant, which would necessitate the young man's leaving home. The lad was an exceptionally bright and capable young fellow and had been employed as a locomotive engineer on the main haulage road, a place on which the success or failure of the colliery much depended.

As foreman of the colliery, the father explained to the suprintendent, in a modest way, how hard it would be to find a suitable man for that place, besides urging that the change would mean the breaking up of his home. The only consolation he got was: The big boss has given the order it must be obeyed.

As a result, the young man sought and obtained a good position with another company. Five or six other persons

were successively appointed to fill the vacancy, but none of them gave satisfaction and the output of the mine was gradually decreasing. Some of the miners left, because their earnings were reduced when their coal was not hauled. For falling off of the tonnage the foreman was called to account. His daily morning mail contained letters asking for explanations of the delay that had occurred the previous day.

Not long after this, the superintendent became convinced that he had acted hastily and sent a request for the young man to return to his former job. The request, however, was refused as the lad was well satisfied in his new position. I cite this instance to how that there are rare cases where foremen's relations are not a detriment, but an actual gain to the organization.

In the same letter, Fairplay refers to the system of promotion adopted by one of the great railroad systems, of the country. I cannot say whether the same plan would work if put in operation in our mine, under the large turnover of labor with which we have to contend. This, however, may not prove a serious objection to the plan. A few of the large companies of the anthracite field have, within the last decade, made many changes in their semiofficial forces. These changes are feared by some of the older miners who think that the company will shortly pay the penalty through a decrease in the efficiency of operation.

QUALIFICATIONS EVENTUALLY ARE KNOWN

I heartily agree with Richard Bowen, in the idea he expresses in his letter, Oct. 9, p. 628, that a truly ambitious worker cannot fail, sooner or later, to have his ability and fitness known to his superiors. His work should be of a nature to reveal this; but if he fears that such is not the case, he should at once take steps to ascertain from his employer wherein he fails. That would give him the opportunity to remedy his faults, improve his service and make himself more valuable to the company.

Mr. Bowen remarks: How many of our mine foremen and firebosses who hold certificates could pass a satisfactory examination given by the general superintendent or manager of their company? Much as I regret to do so, I must admit that many of the men holding such certificates could not pass the examination, annually. However, if this was required by law, these men would study and prepare for such examinations.

In Pennsylvania, today, it is not necessary for mine officials to pass any examination, provided they are equally competent with men who have passed the examination and hold certificates of competency. Let me ask, here, Who is the judge or who will decide that the men are equally competent? It is assumed, of course, that the superintendent decides this question; and the mining laws of the state have thus become a joke among the mining men of the civilized world.

It may be that I have diverged, far and wide, from the subject; but let me say, in conclusion, that a corporation has a perfect right to go outside in search of competent men, although it must be willing to bear the consequences, which may come, in various ways, along the line of disloyalty and dishonesty on the part of some old and faithful employees.

Kingston, Penn. AJAX.

Coal Mines in Scotland

Letter No. 2—I was deeply interested, a short time since, in reading the letter entitled Coal Mining in France and Scotland, "Coal Age," Sept. 4, p. 395, and would have taken up the matter, on behalf of my brother Scots, long ere this had not the printers' strike interfered. For nearly two months, now, we have not been privileged to receive our regular issues of "Coal Age," which we have all missed.

Speaking of strikes, I am certain that my fellow readers will agree with me in expressing the hope that the day of strikes will soon come to an end, and that some permanent form of arbitration will take their place, in the settlement of disputes between employer and employed. It will be the dawning of a new day when we are able to join with Robbie Burns and say, "A man's for a' that."

In one of the last regular issues of "Coal Age," Oct. 2, p. 586, I was delighted to read the letter of my fellow countryman, John A. Douglas, written in defense of the coal mines of Scotland. But, I am going to ask our readers to bear with me a little further and permit me to take up the matter in behalf of the Scottish Branch of the Colliery Managers of Great Britain, as the article to which I have referred previously is knocking at my late associate members of that organization.

Having been one of the first members of the Scottish Branch, I want to say it was founded for the sole purpose of the furtherance of technical education and general safety in coal mining. The aim was to give to its members the benefit of each other's experience in the handling of difficult problems in mining. Only certificated colliery managers were eligible for membership in the Association.

Having had experience in the management of mines in Scotland, England, Canada and Pennsylvania, I am in a position to compare the practice of the management of the mines in these countries. Before proceeding, however, let me say that it would have been interesting if the writer of the article mentioned had informed us as to which of the Scotch coal fields he visited, Ayrshire, Fifeshire, Lanarkshire, or the Lothians.

SCOTTISH MINES ARE MODERN

My judgment is that the majority of mines in Scotland and their management will compare very favorably with the same in France or in this country. The qualifications required for a colliery manager make it no child's play for a candidate to pass the examination for a certificate, which lasts two days of seven hours each. The questions are set by an examining board appointed for each district. Every man on the board is an expert in mining and has a full knowledge of the mining laws, and no pull or graft will get a man his manager's certificate if he fails in the examinations. In respect to the mines, the general rule is, A place for everything and everything in its place. At each mine, there is a clean-up once a week, which is quite different from the slipshod method of management described in the article named.

In this country, it is well known that there are many mine managers (foremen) who have only a service certificate. In that connection, I have been trying to think of a single colliery manager in Scotland, who holds a service certificate. I believe there is not one now living and in active practice. Since the passing of the Mines Act in 1872, there has not been a certificate of service granted, and if a holder of such a certificate is now alive, he must be over 70 years of age. If such a one is still in active practice, we may surely take off our hats to him, after his 47 years of experience; but we must be shown the man.

The fact that the writer of the article speaks of the loss of much coal in the mines of Scotland proves to me conclusively that he is not familiar with Scottish coal fields, since these mines are worked on the longwall system, the seams varying from 16 in. to 12 ft. in thickness. The majority of the mines are worked on leases, and the coal extracted is paid for each six months. There is a fixed royalty per ton and a minimum rental. The operations are surveyed every three months by the landlords' engi-

neers, who measure the average thickness of the coal and the operator must pay for the tonnage computed on the basis of this thickness and the area shown by the survey to have been worked out.

Before closing, I want to refer to the rescue and first-aid work in Scotland, and ask: Can anyone show better equipment for that purpose? The rescue apparatus is not kept as an ornament at Scottish mines, but is in constant use for training, which insures its being in good condition whenever it may be required. This cannot be said of all the rescue appliances in the good old Keystone state of Pennsylvania.

McKeesport, Penn. ANDREW ORR BAIN.

Co-operation Among Mine Officials

Letter No. 1—After reading with interest the article by A. T. Dickson, "Coal Age", Sept. 25, p. 528, it has occurred to me that the coöperation he advocates between mine officials, which undoubtedly is the essence of efficiency in the numerous coal-mining problems of the present day, is needed to an even greater extent among the under officials and their men than among the officials themselves.

When one considers that we are all, from the superintendent to trapper boy, simply cogs in the great wheel of the organization, it is not surprising to discover that the failure of certain cogs, here and there, to mesh together; or in other words, the lack of coöperation between the under officials and their men interferes seriously with the steady routine of the work, and decreases the efficiency of the organization.

In our travels here and there, how often do we find an under official, even one who has just been promoted from the ranks and should know better, became so autocratic as to be almost unapproachable by the men who work under him. He is self-sufficient, overbearing and faultfinding, with scarcely ever giving a word of constructve advice. Finding a workman doing a certain work in a wrong manner, instead of assisting him by a few simple instructions, he gives him what the men term a bawling out.

Some time ago, while on a short vacation in company with two friends, I visited a modern mine that was well worth seeing. Guided by the underground overman (foreman) we went below and, in course of time, came to a place where a couple of tracklayers were engaged laying a switch for an incline driven at right angles to the level. The men had already laid the frog and latches, and it was plain to be seen that the cars could not go into the incline until five or six sets of timbers had been changed.

The overman, observing the fact, at once began to curse and swear. He raved and tore around until he was almost breathless, while the tracklayers stood by looking very sheepish, as though they had had the same dose before and were used to it. The overman finally decided that it would cost less to change the timber sets than to tear up and relay the switch, and, glad to get away, we passed on into the mine.

When out of hearing of the men one of my friends asked the overman why he swore so at his men, and received the reply accompanied by a few expletives that would not appear well in print, the never-to-be-forgiven sons of a Barney-ear would not understand me if I spoke to them in any other manner. He may have thought himself witty, but the overman's humor was entirely lost on his visitors.

When sending these men to lay the switch how much better would it have been for the overman to have said to them: I want you to lay a switch for the new incline in the third 8 entry. Use a No. 5 frog, and put the point of frog exactly where you will find I have marked the rail on the level. Had the overman previously calculated the size of frog required and marked its location in this manner, he would not have had to bawl out his men in the manner described, besides saving the company much expense.

A fault-finding foreman does little more than irritate his men. If a man does a piece of work wrong, take him and show him the same work done right; or explain to him a better way of doing the job. The results of friendly constructive advice secure better coöperation on the part of the men, and the benefit to the company is obvious. How seldom one hears a word of appreciation spoken by an official to a workman who has done a good job. Yet, even a good horse will receive a friendly pat after pulling a heavy load, and he answers with a snort or an appreciative wag of his head.

Let us imagine, for a moment, that we are going about a mine on two separate occasions accompanied by two different officials. In the first instance we come to some men engaged in retimbering an old airway. Looking about a moment, the official exclaims: Well, men, your work looks good, but we are in a hurry to get this airway finished. Now if two of you will go ahead and take out the old timbers and set temporary posts for safety, the other two men will come along behind and put up the permanent sets, and the work will proceed much quicker.

AN EXAMPLE IS CITED

A little further on we come to two men who are pulling out the tracks from an old abandoned roadway. It is observed that they have left a number of ties in and the official says: Men, we want to save as much of this material as possible and I see you are leaving some of the ties. One of the men explaines: The ties we have left are rotten and not worth pulling out. Taking up a pick, the foreman tests one or two of the ties and finds that the men are right. He then cautions them to save all the track spikes and rail splices and as many of the ties as possible.

In contrast with this treatment of workmen, let us turn now to observe the second official. Coming to the men working on the airway, this man begins somewhat as follows: This job is costing me too much, and if you fellows can't get a move on you and make more headway I'll start a new gang in here and put you men where your work will count. Reaching the place where the men are tearing up the track and seeing the ties that they have left as being unfit for use again, he begins to rave and shouts: My God, you fellows drive me crazy. What in thunder and lightening are you leaving these ties in here for? Told that the ties are of no further use, he raves again and exclaims: By the sulphur and brimstone, I want them all taken out and if there is any more of this fooling there will be two men looking for a new job by night. The men have no recourse but to take out the rotten ties, and the company pays for useless labor because the foreman was too proud to satisfy himself that the ties were not worth removing.

These illustrations show two methods of dealing with men, the one by manifesting an appreciation of work done and securing in return the hearty coöperation of the men; and the other revealing a fault-finding method that not only fails to secure the coöperation of the men, but is an expense to the company. I have read that Theodore Roosevelt when president of the United States never failed to shake the hands of the engineer and fireman who drove his train, thereby showing his appreciation of their work. It is such appreciation on the part of the superintendents and foremen that will ever secure the heartiest coöperation of the men in their employ.

In conclusion, I want to emphasize the following essentials: Appreciation of work well done; the giving of constructive advice to workmen; speaking words of encouragement, instead of finding fault when the work is not satisfactory; receiving the suggestions of workmen kindly in the spirit in which they are given; and showing no autocratic bearing. These, I believe, cannot fail to win the heartiest coöperation on the part of all mine workers who take an interest in their work.

Cassidy, B. C., Canada. JAMES TOUHEY.

Roller Bearings for Mine Cars

Letter No. 8—Some weeks ago I read an article in "Coal Age" (Sept. 25, p. 545), drawing attention to the advantage derived from the use of roller bearings in mine-car wheels. I want to endorse all that the writer of that letter has said and add a few comments suggested by my own experience.

No piece of equipment, in use about the mine, is subjected to the same hard service and receives less attention than the average mine car. When one considers the need of the highest efficiency in mine haulage it is not surprising that the choice of a proper car bearing has attracted the attention of coal operators everywhere.

Regarding the old style of plain bearing with which mine cars have been equipped for so many years, the progressive operator readily realizes that this style of bearing is not up-to-date or efficient. He recognizes that, in order to reduce the frictional resistance in haulage and the unit cost of production, he must adopt a type of bearing that will best overcome the frictional resistance of the cars, and reduce the drawbar pull on the locomotive by enabling the cars to move more easily.

Not only this, but the study of the question shows that the cost of lubricating the old plain-bearing wheels greatly exceeds that required in the use of wheels of the roller-bearing type. In addition to these items, it is plainly seen that the locomotive will be able to haul longer trips, which will increase the output of the mine and reduce the cost of its operation.

Following up the line of these thoughts, the operator is led to make further inquiry, and finds that through the proper application of roller bearings, either in the journal box or installed in the wheel hub, all that he has anticipated in the reduction of the drawbar pull and the various items affecting the cost of operation will be realized.

The progressive operator finds, on investigating that the roller-bearing wheel will give the very best results if lubricated three or four times each year, with the proper lubricant. His experience, on the other hand, tells him that the plain-bearing wheel must be oiled each day if any results are to be obtained. He reflects that, this being the case, the labor cost of lubrication will be reduced from $4 to $6 a day, and he is reminded moreover, that expense for repairs will be less by reason of a more lasting application of the lubricant, and wrecks and delays will be less frequent.

In deciding on the adoption of roller bearings, however, the operator is confronted with the choice between flexible and solid rollers. Investigation shows that the flexible type of roller has many advantageous over the solid roller. Being installed in an absolutely fixed inclosure consisting of a strong cage and being spirally wound and alternately assembled, the flexible type promises a longer life of the bearing. It is more easily removed from a broken wheel and installed in another with less loss of time, besides insuring a full contact throughout the bearing and absorbing a goodly portion of the hard shocks that a mine wheel encounters, in striking tipple horns, bad rail joints and other obstructions, to say nothing of the dropping of a heavy load into the car body.

Flexible bearings are used on a heat-treated axle, thereby reducing the chance of many bent and broken axles. Observation shows that almost all large mine-car manufacturers are today using this type of bearing and, considering the long life of the equipment, the saving in power and lubrication, the flexible roller bearing is proving a good investment for the mine operator.

E. J. G.

Huntington, W. Va.

Bolshevism in America

Letter No. 9—I quite agree with the sentiments expressed by Joseph R. Thomas, in his letter, "Coal Age", Oct. 2, p. 588, that it is the lack of intelligence that inclines so many workers to follow the Bolshevik doctrine and practice its principles. If those men could only foresee the misfortune that their actions are bound to bring upon themselves and others there is no question in my mind but that they would turn a deaf ear to its entreaties.

While it is quite evident that there are a large number of men among the strikers, in our mining districts, it is not my intention to class all strikers as being unintelligent. Many of them are not to blame for the action they are forced to take in absenting themselves from their work in the mines. Far better would it be, however, if the mass of our mine workers would study out for themselves the underlying causes of the matters that lead them to strike. All will agree that it is better to think twice before one speaks. A careful study of the situation will often convince men that a strike is not the best way to remedy a trouble.

Consider for a moment the demand for higher wages, based on the high cost of living. A little reflection should serve to demonstrate the fact that the granting of higher wages, by employers to their employees, will surely increase the cost of production. Increase in the amount paid for labor must naturally increase the price of the product; and the cost of living is made greater than it was before. The producer who has to pay his workmen higher prices for their work must increase the price of his goods, or discontinue his business.

A little study along this line shows that the only rational method of lowering the cost of living is to increase production, and thereby overstock the market. That could not fail to have the immediate effect of lowering prices and decreasing the cost of living. Labor and lots of it is necessary to increase production and lower prices; but strikes and lockouts always have the opposite effect, as does also the unreasoning demand for higher wages.

One thing is certain and that is the principles advocated by Bolshevism, claiming to bring relief by destructive violence and the overthrow of governments, can never succeed, because all such measures are contrary to the laws of nature. We have an example of this in the situation in Russia today, where Bolshevism emanated and grew, only to bring misery and distress to the people who embraced its doctrines.

In closing, let me urge that we remember that every man is here on earth to work. Since the time of Adam, man must earn his bread by the sweat of his brow. Labor brings happiness, while idleness leaves sorrow and misery in its trail. Let every true American, therefore, strive loyally for the good of his country, respecting those who govern the state and, by all means, doing what lies in his power to destroy the fruit of Bolshevism, both in the country and in his own mind

Rawdon, Quebec, Canada. C. McMANIMAN.

EXAMINATION QUESTIONS

ANSWERED BY
JAMES T. BEARD

Anthracite Foremans' Examination Carbondale, Penn., May 6, 7, 1919

(Selected Questions)

Ques.—What produces whitedamp and blackdamp in mines and what are their injurious effects on the workmen employed therein?

Ans.—Whitedamp or carbon monoxide (CO) is the product of slow combustion of carbonaceous matter taking place in a limited supply of air, where the combustion is incomplete; for example, the slow combustion of fine coal and slack in the waste or abandoned places in a mine. Considerable carbon monoxide is also found in the return air coming from a mine fire, and the same gas is produced to a limited extent in the explosion of powder, in blasting. Only a small percentage of this gas, say one-half of 1 per cent., in the air breathed for a considerable length of time, may prove fatal. The effect is cumulative and the gas is not easily eradicated from the system, being absorbed by the red corpuscles of the blood.

Blackdamp consists mostly of carbon dioxide and nitrogen mixed in various proportions. It is the result of the complete combustion of carbonaceous matter in a plentiful supply of air. The oxygen of the air is consumed and unites with the carbon to form carbon dioxide (CO_2). The nitrogen of the air remains unchanged, while the oxygen content is depleted. Blackdamp has an injurious effect on the system. When breathed for any length of time it produces headache, pains in the back and limbs, followed by nausea, suffocation and death if rescue is not at hand. The presence of 18 per cent. of carbon dioxide, in an otherwise normal atmosphere, reduces the oxygen content to 17.14 per cent., forming a fatal atmosphere.

Ques.—State how the several mine gases may be detected; in what proportion in the air they are fatal to life and in what proportion will they extinguish a light.

Ans.—Methane, marsh gas or light carbureted hydrogen (CH_4) is the principal one of the hydrocarbon gases found in mines. Olefiant gas or ethylene (C_2H_4) and ethane (C_2H_6), otherwise known as heavy hydrocarbon gases, are rarely found in the mine, except in extremely small quantities associated with methane. These gases are detected by their effect on the flame of a safety lamp. When methane is present in the air, a flamecap is formed in the lamp, the height of the cap increasing with the percentage of gas present, till the lamp flames, which occurs at about 3 or 4 per cent. Methane is not a poisonous gas and its presence in the air is only fatal to life when the oxygen content of the air has been depleted to about 10 per cent., which requires 52 per cent. of methane being present. An oil-fed lamp flame is commonly extinguished when the percentage of methane in otherwise pure air reaches 29.5 per cent. and the oxygen content is thereby reduced to 14.7 per cent.

Carbon monoxide (CO) is detected by observing the effect of the gas on mice or birds confined in a cage. These small animals are prostrated when a much smaller percentage of the gas is present than is fatal to man. The percentage of this gas that is fatal depends on the depletion of the oxygen in the air, the length of time the air is breathed, the physical condition of the person and the amount of his exertion at the time. Ordinarily, one half of 1 per cent. when breathed a short time will prove fatal to life. The gas is highly inflammable and not extinctive of flame, though, having no available oxygen, and not being a supporter of combustion.

Carbon dioxide (CO_2) is detected by its effect to dim and extinguish a lamp. If 18 per cent, of this gas is present in otherwise normal air the result is fatal to life; and 14 per cent. will extinguish an oil-fed flame.

Hydrogen sulphide (H_2S) is commonly detected in mines by its smell. It is fatal to life when 1 per cent. of the gas is present in air breathed for any length of time. This gas, also, is inflammable though not a supporter of combustion and 50 per cent. or more would be required to extinguish a lamp flame.

Ques.—What duty does the mine law impose on the mine foreman when he employs any person to blast coal or rock?

Ans.—The Anthracite Mine Law requires the foreman to ascertain that the person is qualified by experience and judgment to perform such work, before permitting him to blast coal or rock in a mine.

Ques.—Where, in a mine, should safety holes be provided and where should safety blocks be placed?

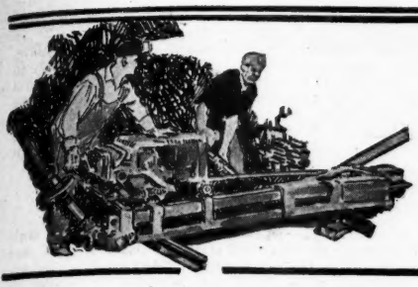
Ans.—Safety holes are required to be placed at the bottom of all slopes and planes and on all haulage roads where men are compelled to travel, unless a sufficient clearance space is available at the side of the road sufficient to enable men to pass the cars with safety. The law requires that these holes shall be of suitable dimensions, not more than 50 yds. apart and kept free of all obstructions.

Safety blocks must be placed at or near the head of every shaft, slope or plane. Safety also requires that these blocks or a good prop laid across the track shall be used in all chambers driven to the rise, to prevent a car from running down to the mouth of the room, after it has been taken to the face for loading.

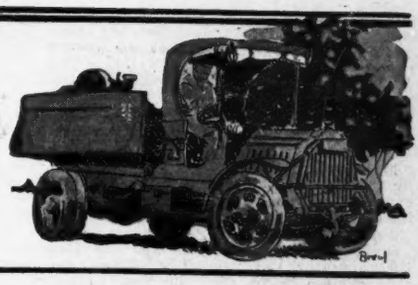
Ques.—Are there any conditions under which the flame will pass through the gauze of a safety lamp? Explain fully.

Ans.—Yes. Flame will pass through the gauze when the wire has become heated; or when the gauze chimney is dirty or the lamp is exposed to a strong air current or a heavy concussion of the air produced by a shot. Flame will also pass through an imperfect gauze.

When the wire of the gauze is heated to a low redness visible in the dark, it loses its cooling effect on the gas burning within the lamp, and flame will then pass through the mesh of the gauze. Dust or dirt accumulated on the gauze may be ignited by the heat of the burning gas and flame be thus transmitted to the outside atmosphere. The pressure of a strong air current or blast of air will force the flame of the burning gas through the mesh of the gauze. If a gauze has been injured and its wires are separated or broken or are burned out, the resulting opening is so large that the wires fail to cool the burning gases in their passage through the opening. Such a lamp is unsafe.



COAL AND COKE NEWS



Charleston, W. Va.

New River field produces coal in spite of difficulties. Production about 75 per cent. This notwithstanding pressure of union officials. On the other hand, operations in Kanawha region almost at a standstill. Miners evidently acting under orders of district officials. Operators generally apprehensive over financial outlook. Coal not being paid for.

Lack of production in this section of the West Virginia coal fields featured the first week of December, although that condition did not prevail throughout the territory reached by the Chesapeake & Ohio. The organized smokeless field of the New River had quite a substantial production considering the difficulties with which the operators in that field had to contend, and, while there was some diminution in production there, it was nothing like conditions which prevailed in the neighboring Kanawha district constituting the southern part of District 17), where operations were almost at a standstill, owing to the continued strike of about 12,000 miners.

The miners in the Kanawha territory were evidently acting under orders. Many of them admitted it. Consequently the production of high volatile coal in this immediate region was not over 17,000 or 18,000 tons for the entire week, the number of mines in operation being few in number.

The 14 per cent. wage increase offered the miners failed to improve conditions, although it was in effect in all organized fields of the state; but it was considered noteworthy as well as significant that the Kanawha field was the only organized field, in which the 14 per cent. had not been agreed to, even under protest. There was no prospect that the proposed grand jury investigation, as well as the restraining order issued by Judge Keller, would alter the situation where miners were still on strike, during the second week of the month.

While operators claimed that the same effort was being made to stop production in the smokeless field in this part of the state, through the activity of union officials, yet their efforts were not so successful as was the case in the lower part of District No. 17. There was a difference, therefore, of only about three hundred cars in the New River field, even though the "check-off" had been discontinued there; the 14 per cent. increase, which became effective on the first of December, apparently appealing to the miners in the smokeless region along the C. & O.

Even where coal was being produced in this section of West Virginia, there was no certainty as to just when it would be paid for, and operators had begun by Dec. 1 to become apprehensive over the financial outlook, since a large proportion of the coal produced in this part of the state during November has not been paid for; in many cases the shipper has not been informed as to the ultimate consignee, nor has he any way of ascertaining just who received his coal and used it. For that reason many producers are experiencing a good deal of difficulty in meeting their pay-rolls and proposed remedies are only temporary.

Neither a 14 per cent increase nor the fact that fellow miners in another part of District No. 17—in northern West Virginia—sufficed to induce the striking Kanawha miners to return to work in any considerable number during the first week of the month, despite the utmost endeavor of the operators to persuade them to do so. In fact it was certain the Kanawha miners were acting under orders not to return to work. Operators found this difficult to understand, since President Keeney of District No. 17 attended the conventions of sub-district No. 3 and Subdistrict No. 4 (in northern West Virginia), where, on Friday night, Nov. 5, and Tuesday night, Dec. 2, respectively, representatives of locals voted to return to work. Keeney's statement was that he was neutral as to advising the miners either to return to work or to remain in idleness; at the beginning of the second week of the month, Kanawha miners were still loafing, except at about 25 mines, where comparatively small forces were at work. As a result of such idleness, only about one-seventh of the usual tonnage was produced in the Kanawha region; the actual number of cars loaded being 346 for the Kanawa field proper, and 345 cars for the Coal River field, the Kanawha field usually having about 2250 loads a week and the Coal River field in proportion.

Pressure was brought to bear on miners of the New River field, by officers of District No. 29 during the first week of December, to cease work, and, while in some instances, union leaders succeeded in inducing men to cease work, production was maintained at about 75 per cent. during the greater part of the week, averaging around 15,000 tons a day. The increase in wages, amounting in some instances to more than 14 per cent., is thought to have been one influence in keeping men at work with Christmas approaching. However, at some mines it was "Off again, on again, gone again, Finnegan," some mines being down one day and running again the next, with conditions just the reverse at other mines. All New River coal, generally speaking, was still embargoed as to eastern shipments, the West getting the smokeless fuel from the field in question.

Huntington, W. Va.

Guyan Valley reaches peak of production for year in first week of December. No sign of labor trouble. High water stops transportation to Logan field on Dec. 8. Financial stringency serious matter with Logan operators. Coal not paid for. Sharp decrease in coal handled by C. & O. system in first week of December, compared with previous week.

The peak of production for the present year was reached in the Guyan Valley during the first week of December, when the output of coal was 249,840 tons or almost 86 per cent of capacity, showing a gain over the previous week of about 3,000 tons, something more than 4,900 cars of coal being shipped to various western points. A total of 4826 hours was put in mining the tonnage mentioned. A loss of only 270 hours or 13,985 tons was sustained through an insufficient car supply, that amounting to about four per cent. of full time capacity as compared with a six per cent. loss during the last week of November.

The loss from a labor shortage was almost insignificant. Indeed, miners were showing extremely commendable perseverence in getting out a large tonnage, and there was no sign of any labor trouble whatsoever in the district, despite the contention of certain mine organizers in the Kanawha field; miners were apparently well satisfied with conditions, taking results as a criterion.

However, physical conditions on the Guyan branch of the Chesapeake & Ohio Ry. were such at the beginning of the second week of December, that a smaller production was anticipated. Egress and ingress to and from the Logan field was cut off on Dec. 8, when a bridge at Martha was washed out; the mines in the Logan field and also the C. & O. having had to contend against two floods within a month. While there was much high water throughout the coal field, it inflicted little damage on any of the mines in the field.

The most serious situation which Logan mines faced was not the strike but financial stringency. Little coal shipped from the Guyan region during December had been paid for by Dec. 10, most of the November shipments having been diverted, shippers in many instances having no knowledge of the ultimate consignee. Consequently the companies in the Logan field were managing with difficulty to meet their semi-monthly pay-rolls. One company in the field, in fact, was unable to meet its obligations owing to its inability to collect for diverted shipments. That was the Aldredge Coal Co., which was forced into a receivership for the time being.

Restricted production in certain fields, penetrated by the C. & O. during the first week of December, was reflected in a sharp decrease in the tonnage of coal handled on the entire system as compared with the loadings during the final week of November. During the latter period 12,664 cars or an approximate total of 633,200 tons were handled; by the end of the following week the amount of coal transported had dwindled to 10,487 cars, a decrease of 2177 cars or about 108,850 tons; the decreases in the Kanawha and Coal River sections being sufficient to offset gains in the Guyan, Kentucky and other fields.

Eastbound shipments of coal over the C. & O. Railroad passing through Clifton Forge were 257 cars less in number during the first week of December than during the last week of November, only 4814 car loads being handled through the division point mentioned during the week ending the seventh.

Bluefield, W. Va.

Smokeless coal fields produce fuel though facing uncertainty of early payment for shipments. Mines speed production. Poor railroad weighing of coal causes great confusion. Some 3700 cars of coal lost. If continued, means bankruptcy for operators. Shipping receipts issued by railroads impracticable. Nevertheless most smokeless fields boost production.

Notwithstanding the fact that the operators of the Tug River, Pocahontas, Winding Gulf and Williamson fields, as well as of all other fields, were in a position where the more coal they produced the more serious was their position financially, yet there has been no relaxation in the effort being put forth in southern West Virginia to keep the country supplied with as much coal as possible. The first week of December found production not only maintained at the same high level reached early in the strike, but in several fields the previous week's production was exceeded, although there was no certainty that much of the coal so produced and shipped would be paid for in the very near future.

Mines in the Tug River field succeeded in speeding production up to 93,550 tons during the week ended the sixth, an increase of 8800 tons over Thanksgiving week. A large proportion of the Tug River coal was still being moved westward and was being regularly weighed; much of the coal going through Portsmouth, being confiscated by the Railroad Administration for redistribution.

In sharp contrast to the satisfactory handling of westbound coal, on the Clinch Valley division of the Norfolk & Western, extremely poor weighing facilities were making for much confusion. Such coal as was being diverted from the N. & W. to the Chesapeake & Ohio, at St. Paul, Va., and from the N. & W. to the Louisville & Nashville, at Norton, Va., or rather a large proportion of such coal as was being confiscated, was leaving the originating road without first having been weighed, and with the connecting road also neglecting to weigh this coal, so that the coal so shipped has reached its final destination without ever having been weighed.

Just how serious such a situation is may be judged from the fact that, since the di-

version of coal began, a total of 3700 car loads of coal have been lost for the time being, and so far every effort to secure weights on the 3700 loads has failed. The 3700 cars represent about 185,000 tons, worth approximately $500,000. This is only one instance of the confusion which exists as to the diversion of coal, and if long continued it means bankruptcy for a number of companies.

The issuance of shipping receipts, a method evolved by the Railroad Administration, is described by operators as impracticable, and is not being utilized by operators in the Tug River fields at least. It was the idea of the operators of the Tug River and other smokeless fields, that the best method of handling the whole matter was to have settlement made at the same time the freight charge was handled, but the Railroad Administration did not appear to take kindly to such a method. Banks are affording relief, but this is proving to be quite a heavy drain.

Just as gains in the output of the Tug River field were scored, during the first week of December, so also Pocahontas mines succeeded in boosting production over that for Thanksgiving week; the increase amounting to nearly 20,000 tons, although the working time in the mines was only increased about three hundred hours. There was a splendid car supply throughout the week, the car shortage loss being reduced, amounting to only 3400 tons. The labor shortage loss was doubled, however, reaching a total of 18,000 tons. About twice as much Pocahontas coal was being shipped to the West as to the East.

As in previous weeks there was little change in conditions in the Winding Gulf field, where about 130,000 tons was being produced. High water on the Virginia Ry. retarded shipments of coal somewhat early in the second week of the month, but not seriously. Miners on the Winding Gulf began the second week of the month with a substantial wage advance in effect.

While not quite so large a tonnage of coal was produced in the Williamson field, during the first weekly working period of December, as was the case during Thanksgiving week, nevertheless the output was above 150,000 tons. Much concern was manifested by operators about their future finances, it being impossible to make ends meet with so little diverted coal being paid for; shipping certificates having no face value and simply putting additional financial burdens on operators when they went to borrow money, since there was no assurance that coal so diverted would be paid for by the unknown consignees.

Fairmont, W. Va.

Interesting labor situation in northern West Virginia first week of December. Miners in conventions vote to return. By Dec. 8 shipments almost normal. Coal goes West. Operators find it hard to meet pay-rolls.

As a large number of miners in the northern part of the state showed a disposition to return to work, a convention was called and was held on Dec. 2; this convention voting in favor of returning to work, although registering a protest against the 14 per cent. increase as being entirely too meagre. As a result of the action of the convention, quite a large percentage of the miners were back at work by Thursday.

Miners in the Flemington field and several other sections, embraced in sub-district No. 3, declined to go to work unless such a move was sanctioned by a convention. On Friday, Dec. 5, such a convention was held at Grafton, action similar to that taken on the night of the second being taken also at the Grafton convention. Consequently by Dec. 8, practically all mines had full forces of men at work and a considerable impetus was given production throughout the entire northern part of the state.

Despite the fact that a great many miners were not at work during the first week of December, 5,204 cars of coal were shipped from the Fairmont region alone, amounting to about 258,000 tons, shipments being 927 cars less than during the previous week. However, by Monday, Dec. 6, shipments from the region amounted to 1039, almost normal. During the week ended the sixth, eastern and western shipments were about equally divided. A very large tonnage of coal, however, was being shipped to Michigan as well as to Chicago for distribution. In common with producers in other fields, northern West Virginia found it hard to meet pay-rolls, owing to the impossibility in so many cases, of collecting for coal diverted. The situation has become just as serious in northern West Virginia fields as elsewhere.

Harrisburg, Penn.

Broadest tax revision plan in 50 years to be undertaken by Auditor General Snyder. To add $10,000,000,000 to corporation assessments. Anthracite and bituminous coal lands included. Has backing of Governor. State to raise big revenue from coal, but no increase in price involved.

Auditor General Charles A. Snyder recently started out on what is said to be the broadest and most comprehensive system of tax revision undertaken by the state in 50 years. Experts say the movement will result in adding more than $10,000,000,000 to the corporation assessments of the state, and will so add to the state revenues that sweeping appropriation on a largely increased scale can be made for the maintenance of hospitals and increased facilities for public schools.

The plan is properly to assess the vast mineral resources of Pennsylvania, the greatest in the United States, but which have been practically neglected as a source of revenue, assessments having been indifferently made on figures furnished by corporation attorneys. Now the assessments are being revised by experts, and millions of dollars will be added to the total. Bituminous and anthracite coal lands, as well as the iron ore lands, are included in the revision.

As a prelude to the investigation, it was found that state assessments of corporation property, in many instances, are only a trifle on the assessments made by counties on the same properties.

Auditor General Snyder, ever since occupying his office, has been an advocate of assessing the mineral wealth of the State for the benefit of the people, and now he has the backing of Governor Sproul and State Treasurer Kephart in the undertaking. Requisition is being made on corporations for all their private papers, extending back for many years, so that the investigators will have all possible information at hand. The tax to be levied will take the place of the coal tax which the Legislature sought to levy in an unconstitutional way, and which proved abortive when tested in court. It is declared the corporation assessment will be increased half a billion dollars in Schuylkill County alone. Officials point out that while the state will receive a big revenue from this source, it will involve no increase in the price of coal—at least not in this state.

PENNSYLVANIA

Anthracite

Pottsville.—A large number of collieries were in operation in this region on Thanksgiving Day to help relieve the national shortage of coal. At some collieries, where the breakers were not in operation, the miners were on hand mining coal which would be available when the plants worked on the following days. In the St. Clair district the mines were idle due to a big patriotic celebration.

Bituminous

Pittsburgh.—The Pennsylvania Bituminous Mine Inspectors' Advisory Association held its annual meeting recently in the Seventh Avenue Hotel, President Thomas K. Adams, of Mercer, presiding. Important questions pertaining to the mining laws of the state and the reduction of accidents in the mines were discussed by Frank Hall, of Harrisburg, assistant chief of the State Department of Mines; President Adams, Secretary-Treasurer Thomas S. Lowther and others also took part in the discussion. The following officers were elected for the ensuing two years: Thomas K. Adams, Mercer, president; Joseph Williams, Altoona, vice president; Thomas S. Lowther, Indiana, secretary-treasurer. These officers and the following will constitute the executive board: Nicholas Evans, Johnstown; P. J. Callahan, Bridgeville; John I. Pratt, Pittsburgh; W. H. Haworth, Brownsville; Richard Maize, Uniontown.

Pittsburgh.—Referee in Bankruptcy, Wm. R. Blair, recently confirmed, provisionally, the sale of the assets of Josiah V. Thompson of Uniontown, bankrupt. In one order he authorized the sale of "certain specific properties of J. V. Thompson" to William M. Hudson and others. In a second order he authorized the sale of the remainder of the real and personal property of Thompson to the Piedmont Coal Co. for $5,500,000. In this sum is included $2,500,000 personal property, $2,000,000 in real estate and coal lands in Pennsylvania, and $1,000,000 in real estate and coal lands in West Virginia.

Referee Blair's confirmation is held in abeyance for ten days and if, within that time, no exceptions are filed, the sale will be confirmed absolutely by the United States District Court. If exceptions are filed the whole matter will have to be threshed out again in court.

WEST VIRGINIA

Beckley.—Operators of the Winding Gulf region of West Virginia, members of the Winding Gulf Operators' Association, in addition to granting an increase in wages to the miners employed in their district, selected officers for the coming year. The roster of officials of this association newly elected is as follows: E. E. White, of the E. E. White Coal Co., Glen White, W. Va., president; C. H. Meade, of the Meade-Tolliver Co., Beckley, vice-president; George Wolfe, general manager of the Winding Gulf Colliery Co., Winding Gulf, W. Va., secretary; W. Gaston Caperton, treasurer. On the executive committee are the above officers and W. B. Beale, P. M. Snyder and J. C. Sullivan. The Winding Gulf field, embracing the counties of Raleigh and Wyoming, principally, has an annual tonnage of 6,000,000. This, it is expected, will be increased during the coming year, owing to the large amount of development work in progress, one company alone now being engaged in preliminary work on a plant to cost $3,000,000, which will have a total capacity of 6,000 tons a day.

Charleston.—Steps are being taken by the Government at Washington to relieve the financial distress, in which many West Virginia operators, big and little, find themselves, as the result of confiscation of coal by the railroads or diversion to new consignees. The great trouble is that in many instances, where coal was diverted, no record was kept or preserved of such diversion; furthermore, producers and shippers have no way of showing who eventually received the coal they shipped. Association secretaries have been asked to secure from members information as to coal taken by railroads and not paid for, and also coal which has been diverted without information as to final consignee. While shipping certificates are being issued, yet many producers and shippers are not only suffering serious financial embarrassment, but some are also on the verge of bankruptcy, because only a small percentage of the tonnage shipped from West Virginia in November has been paid for.

Charleston—Considerable damage was done to the branch lines of the Chesapeake & Ohio R. R. serving coal-producing sections, by the high water on Sunday, Dec. 7; such damage affected production in West Virginia during the early part of the second week of December. This was true particularly on Cabin Creek, Coal River, the Piney branch (in the New River field) as well as on the Guyan branch. As a result a number of mines were closed down at the beginning of the week.

Wheeling—This city occupies a rather unique position during the coal strike, in view of the fact that there are ten coal mines in operation within the city limits of Wheeling; such limits were recently enlarged and one or two of the mines are large operations. It is believed that no other city of its size in the bituminous fields of the United States is in quite the same position, nor in as advantageous a position to be supplied with coal for industrial and domestic purposes.

Gypsy.—Fire which broke out in the interior of the big Gypsy mine of the Consolidation Coal Co., is reported under control and confined to sections where it should be readily extinguished within a short time. The special mine fire-fighting equipment from Fairmont was brought into play.

The fire is believed to have been started by a short circuit of electric wires. It was discovered by miners going to work on the night shift, having started when no one was in the mine. It is one of the Consolidation's large mines, employing several hundred men.

Charleston.—The question of securing settlement for coal shipped is becoming such a serious one that unless steps are taken by the Government to insure prompt settlement for deliveries, a great many companies will become seriously embarrassed and will be compelled to suspend operations for lack of adequate funds. For instance it is estimated that at the end of November only two per cent. of all the coal shipped from the Pocahontas field had been paid for. It is

stated that the question of providing for prompt payment of coal is being given serious consideration by the railroad administration; that instructions have been given regional directors that coal taken by the railroads is to be paid for without delay, and that coal delivered to others is to be paid for promptly. A system of credits for operators is now being worked out with the Federal Reserve Board, it is said. However, great confusion is resulting from the fact that no record has been kept of diversions in so many cases.

INDIANA

Clinton.—Six men were killed and three seriously injured in an explosion at Bogle coal mine No. 3, at Jacksonville, a village near here. All of the men were either mine officials or employees in the office of the company who, in attempting to get out sufficent coal for the boilers, set off a badly prepared blast. The mine has been closed by the strike. The mine was not badly damaged by the explosion. The dead men are: John Stark, Terre Haute, Ind.; Herbert Campbell and Joseph Robertson, Clinton, Ind., office men; S. G. Stephens, Terre Haute, Ind., civil engineer; Charles Watson, Clinton, Ind., assistant mine boss; and John Logsdon, Terre Haute, Ind., room boss.

Chilton.—A newly formed organization the Carter County Mining Co., has purchased an old property known as the Wood mine, in Carter County, near here. The new company is composed mostly of Cape Girardeau capitalists.

ILLINOIS

Belleville.—The owner of a strip mine near Millstadt, Ill., is doing a rushing business while the great strike is on. Farmers are driving for miles to get coal at the strip mine, which they are buying at eight cents a bushel. No men are employed in digging coal, and only as much is sold as the owner of the property can dig out himself. It is a one-man proposition, and the problems of organization are certainly boiled down to their lowest terms.

Duquoin.—A transfer in coal land was recently made by Albert J. Nason, of Chicago, to the Illinois Coal and Coke Co., which recently incorporated at Springfield. The land transferred is in southern Illinois, and it is said that the new owners are expecting to start extensive developments at once and to be planning additions to their acreage.

The air shaft of No. 2 mine of the Zeigler Coal Co., at Zeigler, has been considerably damaged from the giving away of the timbers near the bottom of the shaft. The recent rains are blamed for this condition and men are now at work repairing the damage.

A new slope mine has been completed by a new concern known as Baskin, Smothers & Ross, near Hurst, 16 miles south of here. The coal which was reached at a depth of 96 ft. was found to be excellent for mining with a good roof of slate running at a uniform height. A new switch will be laid to the mine from the Missouri Pacific R. R., affording an outlet for the product of the mine.

Benton.—A coal deal carrying a revenue stamp of $500, indicating a $500,000 consideration, has been filed in the office of the County Clerk of Jefferson County. The deed is from the West Frankfort Coal Co. to the Southern Gem Coal Co. Most of the land covered by it is in the southern part of Jefferson County. The remainder is in the northern part of Franklin County. Four Italians, who participated in the $42,000 payroll robbery at the Middle Fork mine here, June 27, pleaded guilty in the Circuit Court to highway robbery and were given indeterminate sentences in the penitentiary. Judge Kern announced that he would recommend that they be kept confined as long as they live. In the holdup they wounded William Develbiss and John Dolan, employees of the company. Dolan is still in a critical condition in a St. Louis hospital.

Carlinville.—Real estate transfers, filed in the Recorder's office here, show that the Standard Oil Co. is buying coal lands in South Otter Township as far east as the Palmyra line. If the company takes up all the coal land in that vicinity, its holdings will be increased several thousand acres. It now has 30,000 acres.

Belleville.—A night school for the study of mining is to be opened at the Township high school here. State Mine Inspector Wright is at the head of the movement. Only miners holding cards will be enrolled. The Illinois Mine Examiners' Board will have an examination here Dec. 11 to examine miners for state certificates.

KENTUCKY

Lynch.—It is announced from this place, the central city of the United States Coal & Coke Co., a subsidiary of the United States Steel Corporation, on Cumberland River, that the company is still acquiring large areas of coal lands in the Big Black Mountains section. It is said that this company now has over 60,000 acres of coal lands, making it the second largest holding company in eastern Kentucky. The maximum capacity of the plant, 10,000 tons, will not be reached before next spring, although splendid progress has been made around Lynch.

MISSOURI

Hume.—Joseph Klaner, a coal operator of Pittsburg, Kan., has leased a large tract of coal land south of here and will use steam shovels in stripping operations. The Kansas City Southern is building a switch to the mine. The mine will employ about 100 men when in full operation.

NORTH DAKOTA

Wilton.—On Nov. 26, the tipple of the Washburn Lignite Coal Co., at the Wilton mine, was completly destroyed by a fire of mysterious origin. This disaster caused a property loss of $50,000, threw 300 men out of employment and halted the daily production of from 1200 to 2000 tons of coal. This greatly complicates the local fuel situation. The tipple was at the No. 2 shaft of the company, and there seemed to be no natural cause by which can be explained the mass of flames which seemed suddenly to envelop the whole structure. Nothing could be done to save the tipple, and the efforts of firemen were directed to saving the nearby power house. Miners succeeded in closing the mouth of the shaft, thus preventing the fire from gaining a start in the mine workings, which might have been followed by most disastrous consequences. The tipple was said to be the largest and most modern in the state. The Washburn company's property is said to be valued at $1,550,000. The labor situation has been most acute at this mine. Just recently these properties were restored to their owners, after having been in the possession of the state for a week. The radical element here hoped to obtain the mines themselves. It is stated that the tipple cost $30,000, and was insured for $25,000.

Industrial News

Elkins, W. Va.—The Greenmar Coal Co., recently organized, with a capitalization of $50,000, has taken over the Strader mine at Strader, W. Va., operated by the Strader Coal Co. This mine has a 4-ft. seam of Middle Kittaning coal, the lease covering 375 acres. Officers of the newly organized company are W. H. Green, president; J. C. Green, vice-president; J. F. Brown, secretary, and A. F. Martin, treasurer. The company expects to be able, through a number of improvements, to materially increase the output of the mine. Those interested in the Greenmar Coal Co. are also chiefly interested in the W. H. Green Coal Co., which has had several years of successful operation at Adrian. J. C. Green will have charge of the Strader operation.

Clarksburg, W. Va.—The Melbare Coal Co., composed largely of eastern capitalists and Clarksburg people, has leased on a royalty basis about 305 acres on Davidson's Run, near Reynoldsville, Harrison County, with a view to early development. This property represents the consolidated holdings of John A. Gawthrop and the Sharps' heirs, Gawthrop having purchased the holdings of the latter for a consideration of $34,144. No time will be lost, it is stated, in starting development work. The Mebare company was organized with an authorized capital of $100,000, with the following people principally interested: F. R. Long, Montclair, N. J.; C. Waldron, Rutherford, W. Va.; Carl L. Horner, Clarksburg, W. Va.; H. T. Hardesty, Wilsonburg, W. Va.; Philip P. Steptoe, Clarksburg, W. Va.

Logan, W. Va.—With a total authorized capital of $100,000, the Faulkner Coal Co. has been organized to undertake the development of coal lands near Faulkner, in Logan County, W. Va., W. E. Deegans being one of the leading spirits in the organization of the company. Others interested are J. M. Turner, Welch, W. Va.; G. E. School, Huntington, W. Va.; J. H. Taylor, Pinson Fork, W. Va.; J. Frank Grimet, Huntington, W. Va.

Elkins, W. Va.—The Brewer-Harrison Coal Co., a new West Virginia coal producing concern, has as its largest stockholders men long connected with the mining industry of West Virginia, among them being W. W. Brewer, of Belington and Weaver, and H. H. Harrison, of Pierce. Associated with them are: E. S. Baker, of Weaver; W. H. Young, of Clover Lick, and E. A. Bowers, of Elkins. The company plans the opening of mines in the Collins district, of Lewis County, having a capital of $125,000.

Piedmont, W. Va.—The Kalbaugh Coal Co. plans to operate mines in Mineral County, W. Va., having just been organized, with a capitalization of $25,000. This concern was organized principally through the efforts of Z. T. Kalbaugh, Piedmont, W. Va.; N. S. Brown, St. Louis; H. B. Kalbaugh, Westernport, Md.; E. A. Gamble, Westernport, Md.; T. F. Shaffer, Cumberland, Md.

Bluefield, W. Va.—The sum of $50,000 is understood to have been the consideration involved in the purchase of the property, and assets of the Hamlin Coal Co., operating near Dante, Va., on the Carolina, Clinchfield & Ohio R. R., by E. S. Reid, A. S. Adams and others of Chatham, Va. Extensive improvements will be made to the property, and a number of new dwellings will be built for miners.

Bluefield, W. Va.—What was formerly the Buchanan Coal Co. is now the Mayers Coal Corporation, a reorganization, having been effected following the purchase of the company by W. R. Crenshaw and others, of this city. The capital of the new company has been fixed at $150,000. The plant and holdings of the company are near Drill, Va., on the Clinch Valley division of the Norfolk & Western R. R. It is understood that the reorganized company has secured additional acreage, and will increase production to 1000 tons a day.

Charleston, W. Va.—With the prospect of being able to ship coal over the Hazy Creek extension of the Chesapeake & Ohio Ry., on Coal River, owing to the fact that that extension is nearing completion, a number of companies are pushing work on the opening of new mines on Hazy Creek, among such companies being the Hazy Eagle Coal Co.

Sprigg, W. Va.—The Crystal Block Coal & Coke Co. is having plans prepared for the immediate rebuilding of the coal tipple here, in Mingo County, recently destroyed by fire, with loss estimated at about $50,000.

Bradel, Ky.—The Power Coal Mining Co. has recently filed notice of a change in its corporate name to the Wheeler Coal Co., at the same time increasing its capitalization from $15,000 to $100,000, to provide for general business expansion. Its plant is in Knox County.

Charleston, W. Va.—The Hazy-Eagle Colliery Co., recently organized, is understood to be arranging for the installation of the necessary mining machinery, equipment, etc., for the immediate development of a tract of about 1100 acres of coal located in Raleigh County. George Morrow is president; C. E. Krebs, vice-president, and Paul N. Newton, secretary and treasurer. Clark & Krebs, Charleston, are consulting engineers.

Regina, Ky.—The Winston Elkhorn Mining Co. is having plans prepared for the construction of a new coal tipple for increased operations. It is understood that arrangements are being made by the company for the erection of a number of houses for the miners. This operation is in Knox County.

Winding Gulf, W. Va.—The Winding Gulf Colliery Co., in Raleigh County, has completed arrangements for the rebuilding of its machine shop, recently destroyed by fire, with loss estimated at about $60,000.

Wolf Summit, W. Va.—The Wolf Summit Coal Co. has had plans prepared for the sinking of an additional shaft at its property here in Harrison County, for increased operations. The company contemplates the installation of complete mining equipment, machinery, etc., including loading apparatus.

Artemus, Ky.—The Wheeler Coal Co., in Knox County, recently organized with a capital of $100,000, is arranging for the commencement of operations at an early date for the development of approximately 300 acres of coal land, to have a daily capacity of 600 tons. The company has completed negotiations for the acquirement of the Wheeler Jellico Coal Co., the New Trooper Coal Co., and the Power Coal Co., located in this district. R. Wheeler is president and manager.

Evansville, Ind.—W. T. Campbell, president of the Vicksburg Towing Co., Vicksburg, Miss., has recently been in Evansville, Ind., looking for a site for a shipbuilding plant which will employ about 2400 men. Barges and steamboats to be built at the proposed new plant will be used to distribute coal mined in the Kentucky fields. Mr. Campbell is associated with interests in the development of coal lands in the Green River Valley in western Kentucky, where it is proposed to open several new mines within the coming year. The Vicksburg Towing Co. has a contract to distribute coal mined in the Kentucky fields. For this purpose it is said it will have to build 2000 barges with a capacity of 500 tons each and 36 sternwheel steamers.

Pikeville, Ky.—The Praise Elkhorn Coal Co., recently incorporated with a capital of $30,000, has perfected its organization, and is arranging plans for the development of about 300 acres of coal property in the vicinity of Dunleary, Ky. It is proposed to install equipment to give a daily capacity of about 150 tons. H. H. Porter is president; J. W. Cockill, vice president and manager, and W. W. Gray, secretary and treasurer.

Elkins, W. Va.—The Greenbrier Coal Co. has incorporated with a capital of $50,000 to engage in general coal mining operations in the Elkins district. A. F. Martin, W. H. Green and J. F. Brown are the incorporators.

Columbus, Ohio.—Loading of the storage slack piles in the Hocking Valley field, started recently to relieve the stress of the situation, has been stopped because of the action of miners. Laborers were secured to load these piles and after working for some time they ceased work for some reason, presumably because of pressure brought by union miners and sympathizers. The slack piles went a long way to relieve the approaching local fuel crisis.

Columbus, Ohio.—Operators in Ohio and in fact all parts of the country who are either mining or shipping coal are much concerned over the financial situation. Because of the Federal Government regulation, it is found impossible to collect for coal either held on tracks or sold under the distributor, promptly, and many of the companies are short of funds. This matter has been brought to the attention of the Federal Government, and a plan of issuing credits for such coal to be honored by the Federal reserve banks is proposed and may be put into force in the near future. If that is done the situation will be relieved.

Macdonald, W. Va.—The New River Co. is constructing a new tipple at its Summerlee mine at a cost of $35,000, and expects to have the new plant completed and ready for use by Jan. 1. Operations have been suspended during the erection of the tipple, miners of the Summerlee mine finding employment at the Lochgelly operation. It will be possible to screen coal to four different sizes after the new tipple is put in commission. At the same mine, self-dumping cages and automatic caging devices at the shaft bottom have been provided. Similar equipment as well as new screens and conveyors are being installed at the Whipple mine of the company. The Whipple tipple was the first steel tipple erected in the New River field.

Williamson, W. Va.—Negotiations have been consummated under the terms of which the War Eagle Coal Co. has acquired the leaseholds, equipment and assets of the Traders Coal Co. operating in the Williamson field, at a consideration said to have been $125,000. The company acquired was owned and operated by C. L. Biddison and others, most of whom were from McDowell County. The plant of the Traders Coal Co. is a comparatively new one, having been in operation only a few years. Operation of what was the Trader company plant will be directed by Geo. W. Coffey, superintendent of the War Eagle Coal Co.

Huntington, W. Va.—Though people in the northern part of West Virginia are largely interested in the newly organized Sprigg Coal Co., the concern will operate in Mingo County, in the southern part of the state, in the Lee district; the general headquarters of the company will be at Huntington. This company is capitalized at $50,000, and was organized by the following parties: J. C. Miller, Charles Porter, William J. Hare, John R. Bennett and C. Goodwin, all of Grafton, W. Va.

Moundsville, W. Va.—Extensive repairs having been made at the plant of the First Street coal mine, of this city, where the tipple was destroyed a few months ago, operations have been resumed and the company is once more mining and shipping coal with about 50 men at work. Orders have been issued, however, to former employees who will not work now, to remove their tools.

Buckhannon, W. Va.—The Philmont Coal Co. will establish an operation in the Warren district, of Upshur County, where the corporation expects soon to begin preliminary development work on the opening of a mine. This company has just been organized and is capitalized at $100,000, the following Philadelphia, Penn., people being actively interested in the new concern: Llewelyn O. Knipp, George H. Grove, Hiram P. Grove, M. P. Patterson and Charles H. Grove.

Bluefield, W. Va.—Another Mercer County mine will be opened at Goodwill, in the Rock district, by the Northwest Fuel Co. This company having just been organized for that purpose, with a capital of $25,000, by the following Mercer County people: H. J. Hartsock, J. E. Biggs, Mary J. Biggs, Frank C. Biggs and E. E. Hartsook, all of Bramwell, W. Va

Leeds, Ala.—Representativcs of French interests are here to open up mines on the Henry Ellen seam, ten miles from here. The party includes a geologist and mining engineers, who are going over the properties. No railroad reaches this point, and it is possible that one will be built to transport the coal to Birmingham. In the meantime the coal will be mined and trucked to that city.

Obituary

Henry Dwight Merrill, age 85, one of the oldest figures in the coal and iron manufacturing business in the South, died Nov. 26, at the home of his daughter, Mrs. Buelah M. Chairsell, Birmingham, Ala. Mr. Merrill was born in Pittsfield, Mass., in 1834, and came to the South at the outbreak of the Civil war. He located at Holly Springs, Miss., where he engaged in business, operating the first armory for the Confederate Government making rifles. The first cannon of the southern forces also were turned out in this plant.

Personals

William H. Kramer, of Somerset, Penn., has been appointed manager of the Pennsylvania division of the Consolidation Coal Co., with Captain Alfred Pearson, also of Somerset, assistant manager. Mr. Kramer takes the position of Samuel Steinbach, who resigned to enter the service of the Bethlehem Steel Co. Mr. Kramer came to Somerset from Philadelphia in 1900 as a clerk for the Althouse Coal Co., near Berlin. When the company consolidated with the Somerset Co., now the Consolidation, Mr. Kramer took a clerkship with the Consolidation plant at Garrett, coming to Somerset in 1904. He was made chief clerk in 1907, which position he held until Dec. 1. Captain Pearson, formerly chief engineer at the plant, came to Somerset eight years ago from Virginia. L. M. Carter has been advanced to chief engineer.

Hugh Archibald, a mining engineer, with headquarters in Scranton, Penn., and formerly associate editor of "Coal Age," read a paper entitled, "The Need of Better Management in Mining Operation," on the afternoon of Dec. 6, 1919, at the annual meeting of the Taylor Society, in the Engineering Societies building, 29 W. 39th street, New York City.

Dr. W. R. Crane, who has been acting as chief engineer of the War Minerals Relief Commission, since the retirement of J. E. Spurr, who resigned to become editor of the Engineering and Mining Journal, has been appointed chief engineer in place of Mr. Spurr. Dr. Crane was formerly dean of mining at Pennsylvania State College, and during the war gave his efforts most unremittingly and patriotically to the stimulation of war-time mineral industries.

J. B. Connors, a brother of M. S. Connors, Federal manager of the Hocking Valley Railway Co., and formerly a coal man of Dayton, Ohio, died recently at the age of 63 years. He was previously superintendent of the Norfolk & Western R. R.

J. F. White has been appointed district mine inspector for the eleventh district, with headquarters at Logan, W. Va., according to announcement just made by W. J. Heatherman, Chief of the West Virginia Department of Mines. Mr. White was superintendent of the No. 10 operation of the Boone County Coal Corporation.

H. A. Light has been appointed general superintendent of the Coal Land Development Co., which will shortly begin mining coal in Lewis County, W. Va., near Brownsville. Mr. Light has established headquarters for the company in Weston.

John Mahony has been appointed general manager of mines of the Pittsburgh Terminal Railroad & Coal Co., with headquarters in the Wabash building, Pittsburgh, Penn.

Trade Catalogs

Jeffrey Straitflo Ventilators. The Jeffrey Manufacturing Co., Columbus, Ohio. Bulletin No. 270. Pp. 8; 7½x10⅝ inches; illustrated. Brief description of special fan for ventilation of small mines, development of larger ones or for boosting purposes.

Pintite Rigid Couplings for Line Shafts. Smith & Serrell, Inc., 90 West St., New York City. Bulletin No. 102. Description of the device.

Coal and Rock Drills—Miners' and Roadmen's Tools—Specialties. The Leetonia Tool Co., Leetonia, Ohio. Catalogue No. 3, p. 75; 8x10½ inch; illustrated. Complete descriptive catalogue. This company also announces its ability to manufacture anything of a special character in its line.

Dinwiddie Automatic Mine Door. Dinwiddie Steel and Manufacturing Co., St. Louis, Mo. Pamphlet. Pp. 16; 5⅝x8¾ inches; illustrated. Description of the door, its controlling devices and its operation.

Aerial Thawing Outfits and Torches Aerial Burner Co., Inc., Union Hill, N. J. Folder. Pp. 8; 6x9 inches; illustrated. Description of apparatus used in thawing out frozen materials, machinery and equipment

The Optical Pyrometer. The Leeds & Northrup Co., Philadelphia, Penn. Catalogue No. 86-B. Pp. 28; 7⅞x10½ inches; illustrated. Description of a portable instrument for measuring high temperatures at various works; conditions of use and instructions for using.

Allis-Chalmers Oil Engines, Diesel Type. Allis-Chalmers Manufacturing Co., Milwaukee, Wis. Bulletin 1532-A. Pp. 19; 7⅞x10½ inches; illustrated. Description of the Diesel oil engine and its application.

Loading Rock with the Erie Shovel. Ball Engine Co., Erie, Penn. Bulletin S-36. Six-page folder; 8½x11 inches; illustrated. Mainly illustration of the Erie shovel at work under various conditions.

Publications Received

Abstracts of Current Decisions on Mines and Mining. By J. W. Thompson. Reported from January to May, 1919. Bulletin No. 181. Law Serial No. 19. Department of the Interior. Bureau of Mines. Unillustrated; pp. 175; 5⅞x8⅛ inches.

Coal in 1917. Part B. Distribution and consumption. By C. E. Lesher. Bulletin 11:35. Mineral Resources of the United States, 1917, Part II (pp. 1203-1259). Department of the Interior. Bureau of Mines. Unillustrated; pp. 1203 to 1259; 5⅞x9⅛ inches.

Report on the Coal Trade of Canada. For the year ended Mar. 31, 1918. Canada. Dominion Bureau of Statistics. Internal Trade Division. Unillustrated; pp. 59; 6½x9¾ inches.

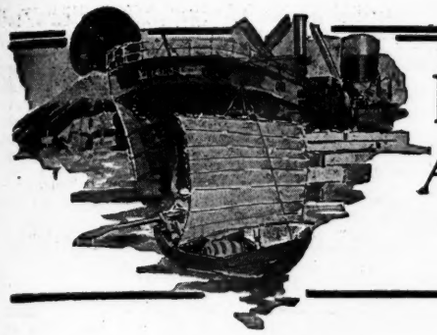
Coming Meetings

The Wholesale Coal Trade Association of New York will hold its next meeting Jan. 20, 1920, at the Whitehall Club, New York City. Secretary, Charles S. Allen, 1 Broadway, New York City.

Northern West Virginia Coal Operators' Association will hold its next meeting Feb. 10, 1920, at Fairmont, West Va. Secretary, George T. Bell, Fairmont, West Va.

American Institute of Mining and Metallurgical Engineers will hold its next meeting Feb. 16 to 19, in New York City. Secretary Bradley Stoughton, 29 West 39th St., New York City.

National Conference of Business Paper Editors will meet at the Astor Hotel, New York City, Jan. 16, 1920. Secretary, R. D. Hall, 36th St. and 10th Ave., New York City.



FOREIGN MARKETS AND EXPORT NEWS

Anthracite Shipments for November, 1919

The shipments of anthracite for November, as reported to the Anthracite Bureau of Information at Philadelphia, amounted to 5,971,671 gross tons, as compared with 5,276,659 tons for the same month last year, an increase of 695,012 tons, and with 6,560,150 tons with October of this year, a decrease of 588,479 tons. The decrease as compared with the preceding month was due entirely to the fewer number of working days, for in addition to being a shorter month, November this year had five Sundays, All Saint's Day, Election Day, Armistice Day, and Thanksgiving Day, so that there were only 21 full working days whereas with only four Sundays and only two holidays (Mitchell Day and Columbus Day) October furnished 25 full working days. The average daily shipments in November showed a substantial and gratifying gain (considering the shortage in bituminous coal production) over October, the average daily records being 284,365 tons for November against 262,406 tons for October. The total shipments for the coal year from April 1 to November 30, have amounted to 46,971,921 tons, as compared with 44,085,610 tons in 1916, the latest normal year, a gain of approximately 3,000,000 tons.

The shipments by railroads were as follows:

Railroad	November, 1919	November, 1916	Coal Year, 1919–1920	Coal Year 1916–1917
Pittsburgh and Reading	1,358,643	1,200,814	9,298,481	8,383,663
Lehigh Valley	1,079,266	1,082,453	8,631,660	8,074,729
New Jersey Central	506,737	546,348	4,291,891	4,254,101
Delaware, Lackawanna and Western	860,356	979,607	7,202,048	6,921,568
Delaware, and Hudson	663,782	628,239	5,394,387	4,776,686
Pennsylvania	406,606	438,869	3,333,221	3,665,338
Erie	620,703	674,261	5,121,336	4,975,491
New York, Ontario and Western	161,385	162,257	1,364,363	1,284,149
Louisville and Nashville	314,193	280,149	2,334,534	1,749,885
Total	5,971,671	5,992,997	46,971,921	44,085,610

Coal and Coke Exports for October

Coal and coke exports, from reports of the Department of Commerce, for the month of October, 1919, have been favorable. As can be seen from the following tables, Canada still continued to receive the largest amount of coal and coke; Buffalo remains the largest customs district which shipped their exports, and the Virginia district is the largest specific district which supplied bunker coal to the foreign trade.

The domestic exports of coal and coke from the United States, by countries, is as follows:

Countries	Coal: Anthracite 172 Tons	Coal: Bituminous 173 Tons	Coke 174 Tons
Austria-Hungary	150	.....	297
Azores and Madeira Isl.	.....	9,003	.....
Belgium	.....	200	.....
Denmark	.....	20,548	.....
France	802	183,812	.....
Germany	.....	632	.....
Gibraltar	.....	4,805	.....
Greece	.....	25,157	467
Italy	2,299	423,939	7,650
Netherlands	1	174,430	2,831
Norway	.....	35,051	132
Portugal	.....	24,201	82
Spain	.....	17,973	.....
Sweden	.....	60,734	.....
Switzerland	.....	69,999	2,422
Turkey in Europe	.....	4,005	.....
England	.....	5,003	.....
Bermuda	683	1,553	.....
Canada	425,511	1,448,605	47,882
Guatemala	1	50	1
Honduras	195	1,003	3
Nicaragua	154	89	3
Panama	.....	5,396	.....
Salvador	.....	1	5
Mexico	442	8,757	14,831
Miquelon, Langley, etc.	30	.....	.....
Newfoundland and Labrador	1,775	1,300	.....
Barbados	50	10,144	.....
Jamaica	.....	4,587	15
Trinidad and Tobago	.....	6,632	.....
Other British West Indies	.....	5,656	.....
Cuba	1,649	115,366	554
Danish West Indies	.....	5,517	.....
Dutch West Indies	.....	4,286	.....
Dominican Republic	.....	335	1
Argentina	.....	95,865	195
Brazil	.....	71,957	280
Chile	.....	1,035	3,691
Ecuador	.....	.....	25
Peru	.....	6,872	582
Uruguay	.....	8,915	2
Venezuela	.....	.....	11
Canary Islands	.....	1,819	.....
French Africa	.....	23,674	.....
Portuguese Africa	.....	17,121	.....
Egypt	.....	28,659	.....
Total	433,742	2,934,686	81,962

Exports for the same period as was reported by customs district were:

Customs Districts	172 Anthracite Tons	173 Bituminous Tons	174 Coke Tons
Maine and New Hampshire	139	62	56
Vermont	1,602	2,036	273
Massachusetts	286	.....	.....
St. Lawrence	135,872	192,084	7,199
Rochester	48,875	60,935	98
Buffalo	233,317	287,027	29,378
New York	6,929	3,959	5,265
Philadelphia	2,332	261,277	5,939
Maryland	2,259	407,382	7,154
Virginia	.....	765,768	831
South Carolina	.....	27,426	.....
Georgia	2	7,113	.....
Florida	.....	958	.....
Mobile	.....	1,998	.....
New Orleans	350	1,452	54
San Antonio	398	1,684	959
El Paso	43	3,290	1,949
Arizona	.....	3,768	11,923
Southern California	1	5	.....
San Francisco	.....	1	5
Washington	73	611	184
Dakota	552	4,466	142
Duluth and Superior	709	4,084	24
Michigan	1	83,154	8,912
Ohio	2	814,146	1,616
Porto Rico	.....	.....	1
Total	433,742	2,934,686	81,962

Bunker coal suplied to vessels in the foreign trade for the same period at specified districts was:

Districts:	Tons
Maryland	86,792
New York	128,543
Philadelphia	83,300
Virginia	273,078

Foreign Bunkering Prices

(Dec. 1, 1919)

Port:	Dollars
Gibraltar (plus 11c. export duty)	$23.80
Algiers	27.12
Malta	26.93
Oran	27.50
Port Said (plus 95c. emergency tax)	27.69
Newcastle	16.50
Southampton	19.40
Liverpool (Welsh coal)	19.78
Plymouth	19.40
Hull	9.60
Fowey	18.83
London-Gravesend	20.20
Dartmouth-Portland	20.00
Cardiff	14.50
Swansea	11.00
North of Scotland	No coal available
Trondjem	26.40
Antwerp (Bascoup)	25.50
Antwerp (American)	33.00
Havre	No coal available
Bordeaux	No coal available
Azores	26.40
Madeira	22.54
Teneriffe	24.34
Las Palmas	24.34
St. Vincent	23.85
Barbados	20.35
St. Lucia	20.35
Trinidad	20.16
St. Thomas, V. I.	20.16
Bermuda	25.00
Curaçao, D. W. I.	22.00
Rio de Janeiro	27.95
Pernambuco	29.00
Bahia	29.00
Santos	27.90
Rosario	26.95
Bahia Blanca	27.33
Buenos Aires	26.60
La Plata	26.60
Montevideo	46.60
Coronel	13.50
Delagoa Bay	6.25
Port Natal	7.00
Cape Town	9.20
Dakar	24.80
Singapore	15.10
Colombo	16.50
Aden (So. African or IndianCoal)	20.10
Aden (Welsh coal)	27.90
Newcastle (approx.)	2.75
Port Kembla	3.30
Adelaide	6.66
Albany	7.90
Fremantle	7.90
Melbourne	5.95
Sydney	.....
Sydney Harbor	3.68
Port Pirie	6.10

Note.—In compiling this table one shilling was worth 18.4c.

Foreign Freight Rates

(From New York)

	Rate	Tons of Displacement
Genoa-Leghorn	$26.50	1000
Spezia-Savona	26.50	1000
Piraeus	28.50	1000
Trieste-Venice	31.00	800
Algiers	26.00	800
Cadiz-Bilbao	23.50	1000
Barcelona	26.00	1000
Antwerp-Rotterdam	22.50	1000
Lisbon	22.50	1000
Gothenburg	24.00	1000
Marseilles	26.00	1000
Stockholm	26.00	800

Hamburg	25.00	1000
Rouen	23.00	1000
Malmo	25.00	800
Pernambuco	16.00	500
Bahia	16.00	500
Rio	17.00	1000
Santos	18.00	600
Rio Grande do Sul	19.50	500
Buenos Aires or La Plata	16.00	1000
Montevideo	17.00	750
Rosario	19.00	750
Bahia Blanca	17.50	1000
Nitrate Range	14.00	....
Havana	7.50	600
Cardenas or Sagua	9.00	300
Cienfuegos	9.00	500
Caibarien	9.50	300
Guantanamo	9.50	500
	9.00	400
Manzanillo	9.50	300
Bermuda	9.00	300
Bermuda p.c. and dis. free		
Kingston	9.50	400
St. Thomas	10.00	500
St. Lucia	11.00	500
Barbados	11.00	500
Santiago	8.50	500
	9.00	400
Port of Spain, Trin	11.00	500
Curacao	10.50	500
Free p.c. Curacao		
Demerara	13.00	400

Coal Shortage in Poland

According to the "Board of Trade Journal," Poland and its annexed territories require 13 million tons of coal yearly, whereas the output, including that part of the Teschen district which is under Polish administration, is at the rate of 5½ millions tons only per annum. Efforts are being made by the Government to obtain supplies from Upper Silesia (600,000 tons per month), but the output there has only reached 40 per cent. of its normal figure. In the Teschen district the production is now estimated at 75 per cent. of the last prewar month, but political and transport difficulties hinder free supplies from either quarter. Transport difficulties are being largely surmounted, and the coal shortage prevailing in Poland is attributed to general causes affecting the whole European Continent. The introduction of the eight-hours day, incessant strikes, etc., have caused a reduction of 40 per cent. in the production of the Dombrowa and Cracow mines.

Coal Troubles in Germany

The coal problem continues, of course, to occupy general attention in Germany. In the course of a debate in the Prussian National Assembly Nov. 10, Herr Oeser, Minister for Railways, delivered a long speech, of which the following is an abridged report.

The Minister, among other things, stated that it had been said that the coal famine was due to a transport shortage. If that were the case, suitable steps would be taken to remedy it. The coal troubles, however, were the result of other causes as well, which could not be removed by any improvement in transport. In the Ruhr district in 1913 the number of wagons placed at the service of the pits averaged 29,546 per day; in 1917 it declined to 18,282, and in 1918 to 14,923. During the first seven days in Nov.—that is, before the suspension of the passenger traffic—the number of trucks rose to 16,661 per day. The call for wagons on Nov. 10 was for 15,812, and in the morning of that day over 16,000 trucks were put at the disposal of the pits, or more than were asked for. The railway authorities, therefore, were not responsible for the stocks at the pits in the Ruhr district not having been carried away. The conditions in Upper Silesia were not quite so favorable, but even there the shortage of rolling stock had been reduced to about 1.7 per cent., as compared with the number of trucks rendered available last year.

The Minister repudiated the suggestion that the coal famine was solely due to deficient transport arrangements, and remarked that on the contrary all the transport misery was brought about by the scarcity of coal. The supplies of coal delivered to the railways were inadequate, the quantity then on hand being only sufficient for six days at the rate of consumption on the Prussian-Hessian railway system. In addition, there was the dirty condition of the coal, which compelled the railways to increase their tonnage requirements very considerably. The complaints made regarding lack of punctuality in the railway services were due to the bad quality of the coal. In one district alone 154 trains were held up on a certain day because the coal was of a bad steam-raising quality. The grates of the locomotives were choked by excessive clinkering, and repairs were increasing.

Prices of American Coal in Fiume

Several coal importing firms in Fiume have been in negotiation for some time with Ameriacn coal exporters with a view to bringing the American product into this market. The lowest price obtainable has been $38.75 per ton, c. i. f Fiume, cash in exchange for documents in Philadelphia. The next lowest price was $40 per ton, c. i. f. Fiume, cash against documents Fiume. An English firm has quoted American coal at $6 per ton f. o. b. New York and $28 per ton freight New York to Fiume in English vessel, being $34 per ton c. i. f. Fiume.

The exporter who furnished the English quotation stated that French and English firms are granting credit for as long as 12 months, based on present rates of exchange. This enables firms in Fiume to do business that would otherwise be impossible. It is assumed that within the next 12 months a stable currency will have been provided and credits established in all the important money centers.

Shortage of Coal in New Zealand

Coal is not being mined in New Zealand in sufficient quantities for home consumption. For the past few years it has been necessary to import 400,000 tons annually, and owing to the strikes and the difficulty in securing shipments of Australian coal, and the shortage of output in New Zealand mines, the railroads, shipping and other industries have suffered. Returned transports brought New River and other grades of coal from Newport News as bunker supplies. The last shipment of this coal cost $7.18 per ton f. o. b. steamer. The supply of coal for the first five month of this year showed a shortage of 70,000 tons as compared with the amount supplied last year.

Italian Market for American Coal

The demand for American coal in Italy is increasing. England has reduced its total export of coal from 750,000 to 330,000 tons per month. It is thought that American coal can be put on the Italian market at a lower price than English coal. France sent to Italy during 1918, 2,000,000 tons of coal, but can now send none on account of the British situation.

During the 12-month period ended June, 1919, the Philippine Islands imported 396,934 gross tons of coal, valued at $3,029,140. For the same period in 1918 the quantity of coal imported totaled 395,275 gross tons, valued at $1,874,997.

An agency is desired by a man in Italy for the sale of American coal. Correspondence may be in English. Reference, 31019.

Coal Mining in South Africa

The annual reports of the Secretary for Mines and Industries and the Government Mining Engineer for the Union of South Africa contains much information in regard to the coal mining industry during 1918.

The war period has emphasized and established the importance of Durban as a coaling station for the British Empire. With its low price and good quality of coal, Durban's capacity for bunkering and shipping is only limited by the amount of coal which can be hauled from the northern Natal coal fields by the single main line of railway. If the Vryheid and South-Eastern Transvaal coal districts develop to their utmost capacity, it would appear that additional railway facilities will be essential.

During 1918, South Africa at last entered the ranks of the world's iron producers, and is at present using her own ores, fluxes, and fuel in the production of pig iron. The question of steel production is now receiving close expert attention, and it may well anticipate practical results before long.

Conditions in England Uncertain

The condition of the coal trade in Great Britain, as reported in the Nov. 21 issue of the "Colliery Guardian," can be stated as follows:

"The general position of the coal markets in all directions is at present more than ever dominated by the prevailing uncertainty of political conditions, the Government's most recent proposal to legislate to limit profits of colliery companies to 1s. 2d. per ton having had a depressing effect upon the trade, as evidenced in the sharp decline in this class of securities quoted on the exchanges where most of this class of business is transacted. On the other hand, the steady rate of output at most of the colliery centers has to some extent relieved anxiety on the score of supplies, and if only traffic facilities were equal to requirement, the outlook for the winter months might be regarded as fairly satisfactory.

"Reports of more speculative activity are indicated in recent market movements, contracting over long forward periods being freely discussed, and although sellers are somewhat hesitant about business over the whole of next year, there is a considerable inquiry for three and six months' terms, with negotiations in cases successfully carried through. Quotations remain at firm levels for export trade, but with a tendency to somewhat easier rates where contracts are fixed far ahead."

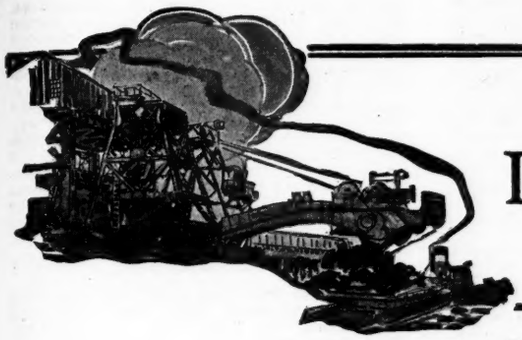
Scotch Coal Moves Slowly

The Scotch coal market is moving along on very quiet lines, but outputs are not up to the mark, which is unfortunate, as there are strong demands for practically all classes of material for home consumption. House coal is in specially good demand, the cold and snowy weather which is now experienced, increasing the requirements for this class of fuel, and at the depots the merchants are busily engaged in dealing with orders. Dross continues to be a difficult quality to dispose of, on account of traffic to the steel works being so much reduced. Large quantities of this quality of coal are still lying at the pits loaded in wagons and causing considerable congestion at the sidings. There is no improvement in the position as to the supply of empty trucks, and a good deal of idle time is attributable to this cause, especially in Fife and the Lothians, where, as a general rule, the pits are dependent on the North British Railway Co. for their supply of "empties." Conditions in the export branch of the trade are quiet, the chief cause of this state of affairs being the continued scarcity of tonnage. At Burntisland, Methil, and Leith this difficulty of securing boats is very acutely felt, as, in these districts the collieries are very much more dependent on shipping business than any of the other districts. Fair shipments are being sent to Ireland from the West of Scotland, and screened and unscreened are the usual qualities which are being shipped.

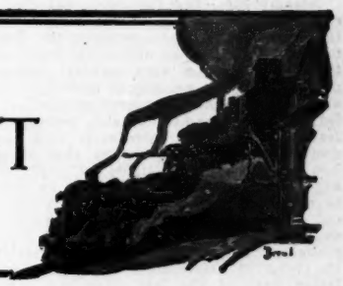
Coal Supplies at Halifax

The supplies at Halifax are none too large, as there is urgent need for fuel in Canada. This prevents many vessels from bunkering, and is a situation considered very serious for the French, Italian and Dutch liners, as British steamers are given preference in this coal station. Operators who have contracts to supply coal for bunkers, not only to America, are unable to secure permits for bunkering, thus causing a serious shortage at some of the other coal stations, especially those in the West Indies.

For the month of November, 1919, 143,071 tons of bituminous coal were shipped as compared with a shipment of 208,894 tons during the same month last year.



MARKET DEPARTMENT



Weekly Review

Conditions should be normal by the first of the year—Bituminous coal prices remain unchanged—Coke production not normal.

With the thermometer slowly falling and prospects of much colder weather ahead, the entire country is hearing rumors which tend to cheer, and some have too optimistically predicted that conditions will again be normal by the first of the year. In the Appalachian region and in certain of the Rocky Mountain states the mine workers show a slight tendency to return to work. However, in the Central Competitive Field there was but little change, and the coal that was mined in that region last week constituted only an insignificant tonnage, the product coming from wagon mines, steam-shovel pits, and certain co-operative plants.

Under favorable operating conditions, the nonunion mines still continued to turn out larger tonnages than normal, and the shipments were rapidly sent to the localities that most urgently needed them. Following advices from men of affairs, the state governments abandoned the idea of controlling and operating union mines, thereby lessening the anger of the striking miners.

During the past week dumping at freight terminals was continued though the amount did not come up to expectations. Though hampered by difficulties, such as severe weather which froze the coal in the cars, the coal consigned to the Great Lakes was satisfactorily dumped. The failures to receive shipments were due more to difficulties in moving freight on the rails than to a shortage of rolling stock.

Drastic regulations were made as to the conservation and distribution of fuel, the same plans being adopted as were put in force during the war. Electric lighting and power companies were ordered to prohibit the sale of electricity for outdoor electric signs, while theatres in the East were allowed but a limited time for evening displays. In like manner, transportation companies decided that the public would be benefited by better traffic throughout the day, if the heat supplied during the rush hour were cut off. Prices of bituminous coal, being under government control, were unchanged.

It is reported from Cincinnatti that there was rapid increase in the prices of anthracite pea and chestnut but the sales in that district were small. The railroads are confiscating whatever coal happens to be along their lines, and the operators are inconvenienced by the fact that the railroads do not pay for the coal so seized. This is indeed a serious state of affairs and causes them much worry.

In the anthracite region the operators are well satisfied that the demand for their product has been generously increased by the conditions in the soft-coal industry. They are slowly catching up with the losses which were incurred toward the close of Federal regulation and shortly thereafter. Colder weather and a greater willingness of their workers to increase production are other factors that cause them to rejoice. They have a steady call for steam sizes, and these are quickly disposed of, but the shipments do not meet with the demand.

Now that the government has control of bunkering of foreign vessels, the export sales have automatically stopped, but the lifting of the ban is being eagerly sought by American shippers. Not much can be spared from Canadian ports for there too the bunkering is under government jurisdiction, and exporters are forced to seek elsewhere the satisfying of their needs.

The coke production though it met the demand in the early weeks of the strike, is not what it was as the orders affecting the shipping of coal for coke manufacture are being strictly enforced. Much oil is being substituted wherever industries can procure it and make the changes that will permit of its burning.

WEEKLY COAL PRODUCTION

From a report of the United States Geological Survey the rate of production on the working days of the fourth week of the strike (Nov. 23-29) was 48.3 per cent of normal. During the first week it had been 29.6 per cent of normal; during the second 33.3, and during the third, 44.5 per cent.

Because of the Thanksgiving holiday, however, the actual output was a little greater than that of the preceding week. The total production is estimated at 5,429,000 net tons, an increase of 53,000 tons, or one per cent over the week before.

The output on Thanksgiving Day itself was 560,000 tons. On the five full-time days it averaged 974,000 tons. The average production per working day during the four weeks ended Oct. 25, which may be regarded as normal, was 2,015,000 tons.

The Central Interstate Wage Conference was in session in Washington during the first four days of the week, adjourning sine die on Thanksgiving Day. Production increased on Monday and Tuesday, as men returned to work in the Cumberland-Piedmont, Fairmont, and other fields of the Appalachian region. No break in the strike occurred elsewhere. Production on Friday was the second highest in the week, but Saturday showed the usual week-end drop.

The total output during the month of November was 18,815,000 tons. The littleness of this tonnage—by far the smallest in any month of recent years—is conspicuous in contrast with the production of October, which revised reports now place at 56,270,000 tons, the largest in the history of the country.

The output of anthracite fell off nearly 300,000 tons but the decrease appears to be entirely due to the Thanksgiving holiday. Compared with the corresponding week, last year, the production showed an increase of 185,000 tons, or 12 per cent. The total output since the beginning of the coal year now amounts to 61,555,000 tons, or about 5½ million tons less than during the corresponding period of 1918. At the present rate of production, however, the anthracite mines are rapidly catching up with their performance of last year.

The production of beehive coke continued to increase rapidly and the total output is estimated at 449,000 tons, the highest attained in any week since last February, with the single exception of the week of September 20, immediately before the steel strike.

Atlantic Seaboard

BOSTON

Trade much relieved over new prospect of settlement. Fuel authorities likely to await result of Indianapolis meeting before putting drastic regulations into effect. Receipts are still very light. Steamers detained at Norfolk since Dec. 5. Railroads confiscating coal all over territory. Sudden demand for steam sizes shows anxiety of some buyers.

Progress being made in shipment of domestic sizes.

Bituminous—The favorable outcome of the conference on Dec. 6 at Washington relieved the tension of the past week or ten days very much. While stocks are ample in most cases there has been a very natural scramble to get supplies for as long a period in advance as possible. Coal has been shipped in fairly large quantities to steam users all over New England, and manifestly this has been done under the impression that either the ban would soon be lifted or that by some argument the authorities would be persuaded to release shipments when they arrive. Without doubt many consumers are apprehensive over the very light deliveries that have been made on contracts from certain districts, but the tone of seriousness that was noted the latter part of the last week was due more to the forbidding attitude of the Fuel Administration than to any impending crisis, so far as New England is concerned.

Mr. J. J. Storrow, who for some weeks has been serving on the district railroad committee, was appointed Dec. 5 to serve as Fuel Administrator of Massachusetts, serving this time, however, under the authority of the governor of the state. It was forecast that drastic regulations were to be put in force in the current week, but it is likely now that all such plans will be suspended until the result of the Indianapolis meeting is known. In general the trade is indifferent to these moves, there being, however, a very decided impression that the shippers themselves, with some intelligent direction or advice from the authorities, are in much better position to accomplish distribution than those whose interests lie in fields wholly foreign to the coal business. It is very much to be hoped that further interference will be made unnecessary by the meeting of the union leaders this week.

Meanwhile, such a volume of coal in transit has been taken by the railroads and there has been so heavy a movement west, together with drastic rules as to consignments, that actual receipts at New England destinations have lately been very light. On the Boston & Albany R. R., for instance, for a space of three or four days there was practically no bituminous coal received. This is certain to have a favorable effect upon the spot market when restrictions are removed. Much depends upon the rigor of the winter, however, and about that it is too soon to form an opinion.

At Hampton Roads on Dec. 5 the coal distribution tightened, and steamers arriving and about to load were held up unless and until permits could be had through the prescribed channels. All such processes take time and in the interim the consignee of the coal is obligated to pay the ship that is detained at the rate of 25c per ton per day. To the agencies it seems a large price to pay for the machinery of regulation.

The railroads in New England are now converting to their own purposes liberal tonnages of commercial coal, even though their reserves, in most cases, are as large as ever at this season. So far we have heard of no commercial shipments being diverted to other commercial users, and it is a matter of satisfaction to the trade that the power of diversion has not been exercised as during the war, when a great many needless complications resulted. There continues an unnecessary amount of car service at destinations, cars in many cases having been held for weeks, before the committee at Boston could decide upon their disposition. It is hoped very earnestly by the trade that the current week will see an end put to all these measures that are simply making it so much more difficult for shippers to take care of this territory.

The anxiety of some of the larger consumers has come out very prominently the last few days in a sudden demand for the steam sizes of anthracite. A number of sales were made, although New England was very slow starting. Such buying has been very discriminating, consumers having profited by their experience during 1918. All the sales have been practically for spot shipment and doubtless it will be found that several hundred thousand tons have come into New England during December, a tonnage that two months ago was not looked for.

Anthracite—There is still a great deal of pressure to get forward domestic sizes, both by rail and by water. In some of the larger cities there is beginning to be less demand for broken and egg, but the producing companies are still making heavy tonnage of egg, in particular, and retailers find themselves obliged to take these sizes, along with pea, to get stove and chestnut. There is more demand for pea than was the case 60 days ago, it having been found that the public in many localities will take kindly to a mixture of chestnut and pea, provided the price is adjusted accordingly.

The barges carrying anthracite have practically resumed normal movement and there is a better feeling among the trade than was the case a fortnight ago. It is believed that now, unless there are further interruptions in transportation, New England will be able to nose its way through on domestic sizes.

NEW YORK

Anthracite steam coals in good demand with prices stronger. Heavy call for the domestic coals continues. Reports of strike settlement please the local trade. Public service corporations have good supply and are not likely to run short of coal. Operators complain because railroads do not pay their bills.

Anthracite—The demand for the steam sizes has grown to large proportions and the prospects are that these coals will soon be as scarce as the domestic commodity. This will be one of the results of the bituminous strike which also gives the anthracite operator an opportuity to regain some of the trade for these sizes lost several years ago.

When the strike in the soft coal mines was ordered on November 1, shippers hardly knew what to do with their supply of buckwheat, rice and barley. In many instances retail dealers seeing an opportunity of getting some egg, stove or chestnut coal, were willing to take a portion of the small coals and in this way shippers without storage facilities were able to keep their supply within bounds.

Instead of shaded prices all three coals are being quoted as full company circular at tidewater and for line trade some shippers are said to be quoting higher than company circular for buckwheat. Much of this coal is being used by consumers of bituminous who mix it with the latter size.

With the exception of the steam coals the market is practically devoid of interest. The demand for the domestic coals including pea, continues with chestnut in the lead. Local dealers are in no urgent need of supplies, but are taking all they can obtain to forestall any rush that may come later.

A large tonnage of the domestic coals including pea continues to go westward and into New England while along the nearby rails salesmen report a good demand.

Although the reports received here indicate a large production, some operators believe a large tonnage could be sent to market if the mine workers were inclined to work longer hours. From reports received here the trade feels satisfied there will be no serious troubles in the hard coal fields as a result of the strike in the bituminous regions.

For the six days ended Dec. 4 the dumpings at the local railroad docks were 4307 cars as compared with 5484 cars for the previous seven days ending Oct. 28.

Bituminous—The possibility that the strike would be ended early this week was good information to the local trade, as the New York public had been threatened with various restrictions in fuel consumption in addition to those already imposed. Orders had been issued and already enforced to turn off the heat in the elevated and surface cars, and that the large electric signs throughout the city should remain dark with the exception of one hour each evening. It was also intended to conserve coal by asking families to limit their cooking and to reduce the lighting in the houses as much as possible. In addition train schedules were to be altered and many trains discontinued, in fact it was anticipated that the war-time schedules would be put into effect on Dec. 10.

Local consumers have not been much affected so far by the strike as most of them have large stocks of coal in reserve and until the priority list was put into effect last week were able to get sufficient coal to meet their daily requirements.

Should the strike be called off within the next few days, shippers believe that conditions will soon become normal and that there will not be any big rush for coal.

Some complaint was heard that certain railroads were neglecting to pay operators for the coal confiscated for the use of the various roads. This in some instances has resulted in serious inconvenience to the operators.

There has been a decline in the bunkering demand due to the orders of the Central Coal Committee at Washington discontinuing the coaling of vessels flying foreign flags, and those flying American flags must secure permits approved by the Committee. Foreign vessels leaving this port must secure their fuel supply at other ports, most of them securing it at Halifax.

The Railroad Administration reported 5028 cars of bituminous on the tracks at the various terminals on Dec. 4, as compared with 4250 cars on Nov. 28, an increase of 778 cars, due to the tightening of deliveries. During the six days ended Dec. 4 there were 3015 cars of bituminous dumped at the local docks as compared with 2531 during the seven days ended Nov. 28.

PHILADELPHIA

Anthracite trade gets further impetus from first real cold spell. Main strain still upon large sizes. No fear of a fuel shortage. Pea coal very active. Independents get premium of 75c on this size. Dealers carefree. No drastic conservation orders issued by authorities yet. Steam sizes in strong demand. Car supply good. Credits in excellent shape. Bituminous shortage now being felt by smaller users. Big stocks on tracks. Increase in production reported. Drastic regulations only rumored.

Anthracite—The first real cold spell of the winter, with the temperature down to as low as 20 in the suburban section, brought many calls on the retail man. As has been the case all season, the bulk of the orders are for stove and nut, and as a result of the new business coming in most yards have been cleaned out of these sizes. Were it not for the pea coal which most dealers have in ample volume there would have been ilittle for the dealers to do.

Calls upon the shippers for increased shipments of the large family sizes have availed the retail trade nothing at all. About the only explanation offered is that this market has been as well cared for as can be expected, and that it is the intention to make good further shipments. The operators believe that the boom in ordering on the part of the consumer is more from the fear of a possible cessation of work in the anthracite mines in sympathy with the other miners, than from a real need of fuel. Some dealers have even admitted this when they had endavored to substitute pea coal for the larger sizes, when their customers said they would not give cellar room to the smaller size, or words to that effect.

The hope is held out to the trade that good shipments of egg, stove and nut will be coming in right along, especially if the weather continues fairly mild, without any heavy snow storms to impede traffic. The producers continue to express confidence that they will be able to handle the local situation if the people will only be patient, and they also intimate that the retail men must work with them in an equitable distribution of coal.

The cold snap late in the week wound up with a snowfall of about an inch, and this brought out the real buyers of pea coal, who always hold back until necessity compels them to buy. As a result the piles of this size have been diminishing very fast during the past ten days or so, and the dealers are now almost a unit in asking for further shipments of pea. It is also believed that a very considerable portion of the pea coal lately delivered has been going to small manufacturing plants, as the delivery of bituminous coal is shut off to these concerns. This week one more of the big independent companies jumped the price of pea coal, and this concern is now selling it for $6.00 at the mines or 70c above company price. Most of the independent companies are now selling pea at this figure, some at 5c more.

As yet the retail dealers have received no instructions whatever from the fuel authorities as to the manner of their distribution. The daily papers are full of all sorts of rumors, and usually when they are tied down to any one in authority they are isuued merely in the form of suggestions. On the part of the dealers, it can be said that most of them are endeavoring to exercise their judgment in properly placing such coal as comes to their yards, feeling in this way they can best obviate the necessity of a return to the troublesome method of fuel distribution as in effect during the war.

The steam trade is growing more active with each passing day and should the soft coal strike continue for two weeks more it is believed it would be a difficult matter to place an order for prompt delivery of any steam size. At the present time there are extremely heavy stocks of both rice and barley in storage, but the former size in particular is moving out in larger volume each day, particularly large calls for it com-

ing in from the West, where they learned to use this size during the war. Barley is not yet in the same class, but is improving daily. The daily production of the steam sizes is very heavy, as all the large companies have extensive washeries in operation, many of which were started last year and have now gotten down to maximum production. Even though the percentage of buckwheat from these operations and the regular mines is very heavy, this size is reaching the point where many shippers actually claim it to be short. Some of the independent operators who had difficulty in moving buckwheat at a cut under company price of $3.40 are now asking as high as $4.00 for single car lots.

A fortunate phase of the anthracite situation is the good car supply, as most operations have at all times sufficient rolling stock to meet their needs. Of course if all the mines were able to reach their maximum production it is possible that even here there might be difficulty. There is harly an operator who does not report he could use from 15 to 20 per cent more workers.

The financial situation as regards payments remain excellent, as all dealers strain every effort to keep their bills paid up to the terms of the shippers, and as a result, the producers have little trouble on this score.

Bituminous—More consumers are feeling the pinch of short supplies in this market. Usually these are the smaller concerns who have had little opportunity to put in reserve stocks. These concerns are now scouting about trying to get fuel of any kind, such as coke or small anthracite sizes to keep themselves running. Others are on the point of shutting down, especially those not on the preferred list of the fuel authorities. There is quite a tonnage of coal standing in cars and should the strike be declared off within the next week there would really be a surplus of fuel especially if consignees were compelled to take in what is consigned; as it now stands, more than one consumer can see his coal standing on the tracks, but is not allowed to have it.

The operators report a slight gain in the amount of coal produced in the Central Penn. region, but this has in no way helped them to take care of their local trade. It is also believed that a gain has been made in the Fairmont district, but an even larger proportion of this coal is being sent westward to relieve the more serious conditions there.

There is all kinds of talk current in the trade as to drastic regulations as to the cutting off of fuel and power but outside of the curtailment of some special passenger traffic on Sunday, no orders have been issued enforcing a cut in the fuel consumed. The public utility plants in this district still have stocks sufficient for two or three months.

Many of the local producers of bituminous are complaining of the slowness of being reimbursed for coal which has been commandeered, and unless some action is taken soon some of them will be compelled to go to the expense of borrowing funds to meet current expenses. It is now reported that a plan of having banks accept notes for such coal will be put into effect to relieve this situation.

BALTIMORE

Things grow tight in Baltimore and the city awakens to the fact that coal at tide does not belong to city as it is divided in part to New England. Drastic orders cut down movement this way and on bunkering. Hard coal situation without much feature.

Bituminous—The situation has tightened vastly and many industries are now living practically from day to day on government allotment. This includes some big ones. Others not on preferential or near-preferential classification, such as brick plants, have been refused coal and may close at any time. The sending of five ships here to load coal at the piers from the reserve standing there awheel for New England railroads awakened the people of Baltimore to the fact that they cannot rely on that coal at tide. More will soon be sent allrail north, it is said, and the government has also ordered 1000 cars shipped from the New River field allrail to New England for railroad relief.

Because the Georges Creek and Upper Potomac mines were working nearly full last week an order was placed that left practically only that production for Baltimore and points east, the Somerset field and a large part of West Virginia production being diverted to the Middle West. The order cut off all coal east except that mined east of Thomas, W. Va., on the Western Maryland Railroad and Terra Alton, W. Va., on the Baltimore & Ohio Railroad, and the Sand Patch Tunnel on the Connellsville division. Another order placed here cut off all loading of bunker coal on overseas ships. This meant the stoppage of putting coal aboard foreign vessels to carry them to the nearest foreign coaling station, and on American ships for either round-trip or one way voyages. Coastwise and bay vessels were left for the time being to get bunker coal sparingly under permits.

The order putting the east practically on an east-of-the-Allegheny production, cutting off from Baltimore the old reliable Somerset region, was probably impelled by the knowledge that the Georges Creek and Upper Potomac were the only other regions working nearly full and the west was hard put for coal of any kind in the past week, however, some trouble came in the Georges Creek region, where two mines at least were hit by united walkout and several by individual desertions, whether merely for the Thanksgiving period or for the period of the strike dispute was a question. In addition many men in the Upper Potomac walked out, mines at Thomas, Coketon, Pierce, Ben Bush and Kempton were closed among others. Many men were also reported deserting anew the workings in the Meyersdale region, so that midweek finds the trade here greatly disturbed. The closing up of last week and the early days of the week saw a big improvement in Baltimore & Ohio R. R. loadings, some 2500 cars being averaged some days. This is only about 700 cars short of a normal run.

Anthracite—The hard coal receipts are about seasonal, except that the receipts are higher than usual. Light receipts are offset to some extent at least by the fact that there is probably a larger per centage of consumers with coal in cellars than ever before at the end of November. The reserve supplies in yards here are small, and again this is offset by the fact that the weather continues rather mild.

Lake Markets

PITTSBURGH

Another week has passed without there being a general resumption of work at the union coal mines, and restrictions upon coal consumption are increased. Pittsburgh is under the same restrictions as other districts, in the matter of consumption, but is particularly well fixed as to supplies, there being shipments from various non-union districts in western Pennsylvania, particularly the Connellsville region. The Pittsburgh district proper is altogether union and there is practically no mining. Domestic consumption is particularly well taken care of by reason of the supply of river coal, in process of accumulation for months before the strike.

Supplies from Non-union Districts. Steel Stocks Almost Exhausted.

Some of the steel works in the Pittsburgh and valley districts have been securing more or less coal from their operations in the Connellsville region, but this movement is now largely shut off by the fuel distribution authorities. For the main part the steel mills have been running on stocks since the inception of the strike, and these stocks are now very near the end, the prospect being that if there is not a general resumption at the union coal mines within a fortnight one-half or more of the steel industry will have to close.

On Dec. 2 the Fuel Administration decided that production of beehive coke should be restricted by 25 per cent., and the regulation is being put into operation for the Connellsville region by limiting the supply of coal cars. The region has been making about 230,000 net tons of coke a week, involving the consumption of about 350,000 tons of coal, so that about 90,000 tons of coal a week should be added to the coal shipments.

There are occasional transactions covering small lots of coal, but there is very little to be bought. We quote the market at Government prices, $2.35@2.50 for mine-run and 25c higher for screened, per net ton, Pittsburgh district.

CLEVELAND

With less than the city's minimum coal requirements coming in, reserves are melting away and drastic curtailment has been ordered. It is estimated fully 200 plants in the Cleveland district proper are shut down or operating part time. Settlement of the strike in the Ohio fields is expected daily.

Bituminous—According to a report of the local fuel distribution committee, the situation in Cleveland is: City's normal daily consumption, 40,000 tons; normal daily consumption by the so-called essentials, 8,000 tons; present daily receipts, 2,000 to 2,500 tons; reserves at start of strike, 100,000 tons.

Although hopes are bright that within a few days—a week at the most—southern and eastern Ohio mines will again be operating, plans are being made for radical curtailment of fuel all around. Lighted outdoor advertising and theater signs are to become dark once more. Street car heating is to be reduced as far as possible. Non-essential industries getting electric power from central stations will likely be cut off, and some may have to cease operations voluntarily because of lack of coal to keep heating and sprinkler systems going.

Iron and steel plants in the Cleveland district, which have just attained an average production of 80 per cent., have been compelled to cut operations to 50 per cent. because of no fuel. Many plants at which strikers have just returned have been compelled to turn the workmen away. In some instances, particularly several large rubber companies at Akron, Ohio, boiler equipment has been switched over to burn oil as fuel.

Where southern and eastern Ohio mines normally produce 1500 tons and upward daily, they now are turning out about 35 cars a day. Railroads are confiscating a part of the meager portion of this 35-car production consigned to Cleveland, and in some instances Cleveland fuel has been reconsigned to Chicago. Hope for resumption of Ohio mines lays in the conference Governor J. M. Cox has called at Columbus. It is reported he has offered the miners a 25 per cent wage increase, and several operators have openly declared their willingness to pay it.

The strike has come to have a bad taste in the public's mouth. At the outset, sympathy was wholly with the operators and against the miners. Government interference, McAdoo's injection of profiteering charges and Garfield's failure to effect a settlement have cost the public's sympathy with the operators. It is felt that had the operators been left to make a settlement with the miners, peace would have come long since. So now the public is indiffferent as to the settlement, just so long as one is made. This is sentiment expressed editorially and by leading producers and consumers here.

The few cars of bituminous coming into Cleveland are being rationed by the local fuel committee. Hospitals are operating on a 24-hour schedule, and other so-called essentials have not a great deal more on their stockpiles. The one "Gibralter" is the Cleveland Electric Illuminating Co., the largest public utility, which supplies from 150,000 to 160,000 kilowatts daily. It has close to 50,000 tons of bituminous in its stock pile. Retail dealers are not taking any orders for bituminous and have no prices. Domestic demand for bituminous, as well as anthracite and Pocahontas, has fallen off despite the freezing weather of the last two weeks, for domestic consumers are adequately supplied. Emergency needs are being met by $11 coke. Anthracite and Pocahontas prices remain unchanged, with receipts light.

Lake Trade—What is believed to be the last bituminous cargo of the season was loaded at Toledo, Ohio, Dec. 8 for Lake Michigan. Several cargoes for Lake Superior have been taken in the past week. Lake Erie docks have dumped an average of 350 cars a day, compared with 2500 cars a day in a normal November. Cargoes to Lake Michigan and Lake Superior in the last few days have been bringing $1.25 a ton, against the summer freight rate of 50c to Duluth and 47½c to Lake Michigan.

In November Duluth received 310,200 tons of bituminous against 1,076,000 in November, 1918. To Dec. 1, Duluth receipts of bituminous have been 6,855,900 net tons, against 9,541,900 tons of the same week the year previous.

CINCINNATI

Hills of bituminous fluctuate. Normal production looked forward to with improvement of labor situation. Consumers subject to drastic restrictions.

The local coal market was featured last week with a fluctuation in prices. In the early part of the week bituminous coal sold at $6.75 delivered, and by Saturday was

$7.25, but their sales were small. At the present time jobbers are filling orders only from regular customers and are taking on no new business. Rail receipts have almost stopped. The market is depending entirely upon the river for fuel. Condensed reports received on the coal market during the past week were as follows: New River district improving, Fairmont district 60 per cent. of the miners at work, Kanawha and Kentucky district not much improvement.

Some coal men say that if the West Virginia and Kentucky operators had had any amount of barges on hand when the coal strike was declared Cincinnati would not have suffered because coal could have been brought here from the nonunion mines by water. With the improvement in the labor situation at Fairmont, W. Va., coal men look for normal production next week. A score or more of manufacturing plants in this vicinity have closed down because of the lack of steam coal of which the local market is practically stripped and all available is being distributed to public utilities and essential industries.

Cars of coal on tracks here decreased from 500 to 200 during the past week with none coming in. Some improvement in routing cars to the Kentucky coal fields has been noticed. Prices on coal are believed to ease up somewhat because of the recent rumor that the government will set a fixed price on all coal. There is little or no smokeless coal to be had, owing to the heavy demands from eastern markets.

Passenger service on all railroads in and out of Cincinnati is to be reduced Dec. 9, from 12 to 25 per cent., as a coal conservation measure. Retail dealers have sent out a warning to domestic consumers to prepare themselves for far more drastic restrictions than they have thus far been subjected to. It became known last week after a careful survey of this district, comprising four states, that local industrial plants and dealers were better stocked with coal at the beginning of the strike than any other city in the country. No improvement in the coal situation is looked for here until the grievances between the operators and miners are thoroughly settled.

COLUMBUS

No change in the strike situation in Ohio has taken place. With the exception of a few small wagon mines and co-operative concerns, including stripping operations, no coal is being produced in the state. Efforts are being made by Governor Cox to secure a wage settlement in the state.

The fuel situation in central Ohio and in fact in all parts of the Buckeye State is approaching a crisis. Central Ohio was apparently the best supplied of any section in the Middle West for some time, and little concern was expressed by steam users. But the situation is steadily growing worse until many manufacturing plants face a shut-down unless something is done to increase the supply of coal. So far the local distributor, B. F. Nigh, has been able to supply practically all calls for fuel, but surplus stocks are being depleted and with little coming in from the outside, steps are now being taken to husband the supply.

Orders have been issued to discontinue the lighting of electric signs and to do away with all unnecessary store illumination. So far no steps have been taken to curtail the business hours in mercantile establishments, but that is looked for soon if relief does not appear. Retailers have been supplied in most cases but this done after investigation of the needs. Retail stocks are low but when it is shown that coal is needed to take care of the public it is forthcoming. Hospitals and schools are also supplied and public institutions have been taken care of. Some manufacturing concerns are running low on fuel, and these may be shut down at any time. The public service concerns are fairly well supplied in central Ohio, but in the northern part there is considerable inconvenience because of lack of fuel. Service is being crippled in many instances.

Governor Cox late last week called upon Ohio operators and miners to get together on a wage scale, and the whole of Dec. 5 was spent in conferences. First, the operators were called in and they told their side, and later the miners' officials were heard. There was no joint conference between the two sides. It was believed for a time that prospects for an agreement on a wage scale in Ohio were bright, but operators and jobbers cannot see the matter in that light. It is figured that in case the operators agree to give a certain advance, say 20 or 25 per cent., this must be ratified by the national officers of the United Mine Workers, and that would be unlikely. So the matter rests where it was before.

Prices of coal delivered have not changed materially recently. A large part of the coal sold by dealers was on previous orders and the usual prices are secured. Hocking lump sells from $6.00@6.50 and mine-run from the Hocking field at $5.25@5.75. Pomeroy lump is strong at $6.50. West Virginia splints are quoted at $7.50 for lump, and $6.75 for mine-run. Pocahontas is scarce and sells in the neighborhood of $8.50.

BUFFALO

Still waiting for the miners to go to work. Slowly, slowly disappearing. Not agreed as to the amount. Coal men have nothing to do. Anthracite moving well by lake, but soon to stop.

Bituminous—The supply is not what it was, of course, but the authorities do not agree very well as to how much is left. Oddly enough it is now reported that the nonunion miners, who remained at work pretty well at first, are not doing as much as they were. Somebody says that the country bank miners are having a fine trade and then a telegram is received which reports that the West Virginia strikers have been ordered back to work by their leaders.

All these things may be true and they may not. The shippers have nothing to do but sit about and discuss them. One man will express a positive opinion that the strike is about at an end and the next one will say that it will last till the union and the operators get together and form a new wage scale. Some have confidence in the Government and say that Garfield never gives up, and others are sure that the efforts by authority have come to nothing.

The consumers are becoming uneasy. This section hears that the scarcity is regarded more severe westward than it is here, and so the coal is all being sent past us and soon we shall have none. Coal starts for a consignee and instead of the car there comes a notice that it has been confiscated by the railroads. Canada is getting no coal at all, and is fortunate that so much was bought before the strike was ordered. For that precaution the consumers, there and also here, can thank the jobbers, as they were persistent in predicting strike and fairly ordering their customers to lay in all they had storage for.

What little coal is moving goes on at old prices, $4.45 for Allegheny Valley sizes, $4.80 for Pittsburgh and No. 8 lump, $4.65 for same three-quarter, $4.20 for mine run and $4.10 for all slack, with $4.60 for smokeless and $5.70 for Pennsylvania smithing, all per net ton, f. o. b. Buffalo.

Anthracite—The situation is about to change radically on account of this being the end of the lake season. Only a few cargoes will be loaded now and then, the supply will be turned into the city trade till that is satisfied, as it was last year. The consumers have remained pretty quiet lately, but they are getting impatient, and if the supply should continue small after the loading to the lakes ceased there would be a big howl.

All furnaces which can burn coal will have to give up their natural gas on the 15th, and that will make a big increase of coal consumption. Prices are so high that some are buying soft coal and small sizes to mix in, as the cost can be much reduced in that way. Quotations are as follows:

	On Cars Gross Ton	At Curb Net Ton
Grate	$8.55	$10.20
Egg	8.80	10.65
Stove	9.00	10.85
Chestnut	9.10	10.85
Pea	7.75	9.30
Buckwheat	5.70	7.75

The lake trade has been badly hampered for some time by bad storms on the upper lakes, but there has not been much disturbance here till last week, when the wind rose to 84 miles an hour, though the damage done was not as great as might have been expected. Shipments for the week were 93,255 net tons, of which 27,200 tons cleared for Milwaukee, 23,900 tons for Duluth and Superior, 17,000 tons for Fort William, 12,900 tons for Chicago, 7,000 tons for Waukegan and 5,255 tons for Ashland. All rates have been $1 lately, with some offers of $1.25.

The shipments for November were 570,700 tons as against 638,700 tons for the same month last season. For the season they were 4,276,518, as against 3,471,993 last season.

Coke

Buffalo—The demand is somewhat better, as the furnaces return to steady operation. The strikers are defiant and are reported to have made some violent threats lately, but the mills are all running on what is said to be full time. The spurt in iron ore receipts lately is now over, as the ore freezes in the upper lake pockets and cannot be loaded. Coke prices are still based on $9 for 72-hour Connellsville foundry, $8 for 48-hour furnace and $7 for off grades.

DETROIT

Though in no immediate peril of serious shortage of bituminous, Detroit's diminishing supply arouses apprehension.

Bituminous—Information nas come to the Detroit Coal Exchange that the Railroad Administration is seizing a larger part of the coal consigned to Detroit than was done in the period immediately following the enforcement of government regulation. F. E. Reeves, secretary of the exchange was advised that on Dec. 1 only one car of coal for Detroit was waiting in Toledo, through which practically all of the city's bituminous supply is carried.

So far Detroit appears to have experienced little hardship from the bituminous miners' strike. The volume of shipments has been greatly reduced, but the supply has not been shut off and the coal received has served to make provision for consumers who are dependent on continuance of a more or less regular movement. With this assistance and the reserves established by many of the large consumers during the summer months, there apparently has been enough coal to meet the requirements of all classs of consumers.

Ewald Sheiwe, president of the Detroit Coal Exchange, who has supervision of distribution under the Regional Committee, estimates that there is enough coal to take care of the needs of factory and household consumers for approximately a month, which places Detroit in a more favorable position than many of the other western cities. Just what results will follow the enforcement of the government restrictions on delivery to the first five classes in the priority list is yet to develop.

Anthracite—Falling temperatures during the week have created a more urgent demand from household consumers for the prepared sizes of anthracite. Retail dealers' stocks are very low, and their attempts to obtain additional supplies are not meeting with as prompt a response as would be desirable. Complaints are made about delay in filling orders and about slow movement of shipments after coal is loaded on the cars.

Lake Trade—From the present outlook no coal for lake shipment will be loaded after the end of the present week. Loading during the week was limited to a few cargoes of anthracite for delivery at the American and Canadian head of the lakes and about a half dozen cargoes of bituminous for Lake Michigan ports to help out the winter fuel supply of the northwestern railroads.

TORONTO

Coal situation very serious. No bituminous for industries until hospitals and public utilities are supplied. Many factories likely to close down.—Anthracite supply adequate for present demand.

The coal situation is very serious, and unless relief is obtained shortly many industrial plants will have to suspend operations. H. A. Harrington, Provincial Fuel Administrator, states that the needs of the hospitals and public utilities will be first supplied, and no bituminous will be delivered to industrials until they have been provided for.

Stocks at the hospitals are nearly exhausted. There is plenty of anthracite on hand and coming forward for present demands. Some of the manufacturers are burning steam sizes of hard coal. Some bituminous is being brought in from outside points of Ontario and is selling at an average of about $15 per ton delivered, but the supply from this source will be very shortly exhaused.

LOUISVILLE

Small mines throughout Kentucky fields reported to start operations. Some sections doing very little, and production light. Retailers out of coal.

The situation so far as production is concerned is more promising than it has been. Reports from various sections of the state indicate larger and better operations. The Straight Creek field in southeastern Ken-

tucky is going back fast, and operations in Knox County are improving. Hazard County is operating as near to full as car supply will permit. Mines in northeastern Kentucky are reporting operations. Harlan County shows a few commercial mines in operation, but the only two plants of any size that are working in that field are the mines of the Wisconsin Steel and United States Coal companies.

It is claimed that the Southern Appalachian Field is the strongest organized field south of the Ohio River. Secretary McCoy, of the organization at Knoxville, has disputed statements of labor leaders, relative to the number of men who have returned to work.

Secretary Hord, of the Hazard Operators' Association, claims that car shortage if holding down operations in the Hazard field, where labor troubles have not interfered materially.

Announcement was made at Middlesboro, Kentucky, on Dec. 2, to the effect that thirty-five local miners' unions, of District 19, had signed up under the fourteen per cent. agreement, and that a total of 1500 had returned to wok. The contracts have the endorsement of S. A. Keller, of Middlesboro, president of the District. Mr. Keller has gone to the Jellico fields, and stated that he figured that the miners in that section would agree to the new temporary agreement if the operators would agree to temporary agreements to be followed by a joint conference when the strike is settled in the Central competitive field. He believed that he could insure 100 per cent. of the men at work by the end of the week.

Western Kentucky and southern Indiana miners are reported to be going back fast, but production is not increasing as fast as reports would indicate.

Starting Monday industrial plants in Louisville went on a forty-eight hour per week basis, and all theaters, business houses, office buildings, stores, etc., were regulated, under orders of the Southern Committee at Atlanta.

Retailers of Louisville report that their stocks are very low, and that they are getting practically no coal, as the railroads are very slow in making releases. Mild weather has held down retail demand, but threatened colder weather may bring some heavy demand and actual suffeffring.

BIRMINGHAM

Increase in coal production. Retail docks are low. Mine workers rescue operations. New fuel order will increase supply for distribution.

Coal production in Alabama for the week ending Nov. 29 reached the highest figure for any like period in 1919, with the exception of the three last weeks in October, when extraordinary efforts were being exerted to accumulate coal on account of the approaching strike. Statistics showing that 291,874 tons of coal were mined during the last week in November, which was an increase of about 20,000 tons over the previous week. However, unless government restrictions are lifted shortly non-essential fuel consumers in Alabama territory will suffer a coal shortage along with those in other sections of the country, war-time restrictions being in effect and much is being diverted to western and southwestern territory not normally supplied from this district. Coal produced in the Walker County field and from other mines adjacent to the Frisco not confiscated by that line is diverted to western territory.

The order of the fuel administration cutting the use of coking coal by furnace companies 50 per cent. will add greatly to the tonnage made available for distribution to the preferred classes, as several of the largest furnace producers have not taken on any commercial business in several years.

Retail yards are beginning to run low on stocks, and very little coal is being received locally to replenish the supply of domestic grades. Wagon mines around Birmingham and in other parts of the district are helping out the situation to some extent, and much coal is being handled by trucks for both domestic and steam use.

The working forces at the mines have been stimulated considerably as a result of the increase of 14 per cent. in wages made effective Dec. 1, and with the exception of a number of small mines in the Cahaba field, which remain idle account of miners refusing to take up their work, all other operations are working, some few with forces somewhat under normal.

Coke

CONNELLSVILLE

The "Courier" reports production in the Connellsville and Lower Connellsville region in the week ended Nov. 29 at 237,455 tons, an increase of 6151 tons. Wage advance of 14 per cent. Wild market in spot coke owing to order restricting production. Contracting largely concluded.

Effective Monday, Dec. 1, the Connellsville region advanced wages all around by 14 per cent., this covering mine labor and oven labor equally. The region has always been nonunion, but there has been much restlessness and it was regarded as important to post notices advancing wages as soon as it was decreed at Washington that the union bituminous scale for the central competitive district should be advanced. The wage advance adds nearly 50c to the cost of producing a ton of coke.

There has been an absolutely wild market in spot coke since the decision at Washington of Dec. 2, that beehive coke production should be restricted by 25 per cent. Furnaces not usually tributary to the region have been buying for some time, through their usual soueres of supply which were shut off, while many furnaces having contracts for Connellsville coke tried to buy spot lots as a reserve against their contract shipments being curtailed.

The market a week ago was quotable at $6.25 for spot furnace. Tuesday of this week it became $8, with $8.50 the next day and $10 the day following. Foundry coke has sold at about the same prices. The total turnover has been small and there is no regularly quotable market. The 25 per cent. restriction in output is about to be put into effect, through the medium of the car supply. Some operations will have to erect temporary trestles for loading coal.

More than half the furnace coke contracting for the first half or all of 1920 has been done. Early contracts, six weeks or more ago, were at $5, after which $5.50 was done, and finally two or three weeks ago $6. Then ratio contracts were turned to and a great deal of business has been put through at 5½ to 1, based on basic pig iron at valley furnaces. A few contracts have been made at 5 to 1. At the present market, $33, the contracts would invoice coke at $6.60 and $6 respectively.

Middle West

MILWAUKEE

Coal still arriving by lake, but stocks are being drawn upon heavily by the Fuel Administration. Strict economy urged.

Coal men are having another taste of wartime restrictions, with the accompanying public hysteria. Dockmen and government representatives have agreed upon rules which will result in minimum coal consumption by manufacturers as well as in private homes. Distribution will be restricted so that the supply of fuel may reach as wide a range as possible. Cargoes are still arriving by lake and more are booked to come. Train loads are going to the interior daily, however, and the huge coal piles on the docks are beginning to show the effects of the drain. November receipts fell behind the record of yast year, the aggregate being 127,007 tons of anthracite and 176,778 tons of soft coal. December is also bound to show a decrease as against the same month of last year.

ST. LOUIS

Coal shortage acute here now. A little smokeless, Kentucky and Alabama coal coming in. Gas coke supply about exhausted. Byproduct will last about ten days longer. No mines working.

The local situation is beginning to become an acute proposition now. All of the Illinois coal that was held in Missouri is gone, but there is some smokeless mine-run coming in from West Virginia, some good coal from eastern Kentucky, and also from Alabama, but most of it is in mine-run form and is retailing at from $8.00@10.00 a ton.

Steam plants are using oil, and a few are putting in gas under their boilers. Perhaps as high as 15 to 20 per cent. of the industrial plants in St. Louis are now using oil. Other plants are being rapidly fitted up for oil, and in the meantime are getting along on coke and wood. The burning of oil is considerably higher than the cost of coal.

The supply of gas coke is about exhausted, and it is estimated that the byproduct coke, at the rate it is being loaded out now, will last about ten days. Practically no gas coke is being shipped out of town, and only a limited quantity of the byproduct, and then in emergency cases.

The conservation measures in St. Louis are a farce, as they are not systematically outlined and are too vague to be taken or considered seriously.

All the nonessentials had ample time to load up with coal, while the essentials could not get any and now there is no coal for anyone. It was failure to properly distribute the coal in the beginning that has caused the situation in St. Louis to be as acute as it is.

In the country districts in some places the situation is serious beyond description where light plants and public utility plants have been obliged to shut down, and only by the cutting of green wood have the water works been able to keep going, and this applies also to several public institutions.

In the western part of the state, as well as in the central part of Missouri, the local strip mines are being taken over by the state and being worked. At Moberly and one or two other places the mines are working because the operators gave the miners thirty-one per cent. increase, but the tonnage produced is so small as not to be considered a factor in the local situation.

There are no mines in Illinois working and no chance of any going to work, judging from conditions at present. There are no restrictions on prices and there is considerable profiteering on the part of the retailer, who is forced to do it because the railroads charge him for coal about twice as much as they should. The railroads are also charging 15 cents for rebilling charges, etc., in spite of the fact that Director General Hines said there is no authority for this charge. The whole situation as far as the Middle West is concerned has been badly managed from the very beginning, and in St. Louis in particular.

Recent Coal and Coke Patents

Coal mining chute. A. Malinowsky, Throop, Penn., 1,306,704. June 17, 1919. Filed Sept. 12, 1918. Serial No. 253,749.

Segmental grate bars. C. R. Waid, Birmingham, Ala., 1,306,729. June 17, 1919. Filed Aug. 16, 1918. Serial No. 250,210.

Mining machine. F. L. O. Wadsworth assignor to Jeffrey Mfg. Co., Columbus, O., 1,304,829. May 27, 1919. Filed Feb. 19, 1912. Serial No. 678,567.

Miner's cap. M. J. Gibbons, Shenandoah, Penn., 1,305,895. June 3, 1919. Filed Dec. 6, 1918. Serial No. 265,584.

Furnace stoker. T. A. Marsh assignor to Green Engineering Co., East Chicago, Ind., 1,305,482. June 3, 1919. Filed Feb. 16, 1917. Serial No. 148,926.

Coal cleaning apparatus. W. J. Patterson and R. M. Bickley, assignors to Heyl and Patterson, Pittsburgh, Penn. 1,312,867 August 5, 1919. Filed March 5, 1919. Serial No. 280,854.

Mine working machine. N. A. Newdick, Columbus, Ohio. 1,308,137. July 1, 1919. Filed Jan. 24, 1916. Serial No. 73,814.

Briquet machine. S. E. Moren, Buvabik, Minn., 1,306,309. June 10, 1919. Filed Oct. 10, 1918. Serial No. 257,606.

TO TAKE FURTHER STEPS TO SAVE BUNKER COAL

Further conservation of bunker fuel is planned by the Central Coal Distributing Committee by putting into effect new restrictions on the distribution of bunker coal. Ruling has been made by the Committee that all merchant vessels, engaged in the trans-Atlantic service, and not sailing on a regular schedule, must obtain their bunker supplies by individual licenses to be issued by the port committee at the various American ports.

The committee's ruling, it was announced, does not affect shipping engaged in the coastwise service, nor vessels plying the trans-Atlantic trade routes on a regular schedule.

CURRENT PRICES—MATERIALS & SUPPLIES

IRON AND STEEL

PIG IRON—Quotations compiled by the Matthew Addy Company as per Department of Commerce Committee Schedule.

	Current	One Month Ago
CINCINNATI		
No. 2 Southern	$34.60	$32.60
Northern Basic	34.00	31.05
Southern Ohio No. 2	36.55	31.55
NEW YORK, Tidewater delivery		
2X Virginia (silicon 2.25 to 2.75)	39.40	35.65
Southern No. 2 (silicon 2.25 to 2.75)	41.40	36.50
BIRMINGHAM		
No. 2 Foundry	33.00	30.00
PHILADELPHIA		
Eastern Pa.	38.10*	33.00*
Virginia No. 2	39.10*	34.40*
Basic	34.60*	29.00†
Grey Forge	34.60*	29.40*
CHICAGO		
No. 2 Foundry Local	36.25	31.40
No. 2 Foundry Southern	34.60	29.40
PITTSBURGH, including freight charge from the Valley		
No. 2 Foundry Valley	.....	32.40
Basic	34.40	28.40
Bessemer	35.40	29.35

* F. o. b. furnace. † Delivered.

STRUCTURAL MATERIAL—The following are the base prices, f.o.b. mill, Pittsburgh, together with the quotations per 100 lb. from warehouses at the places named:

	Mill Pittsburgh	New York Current	New York One Year Ago	St. Louis	Chicago
Beams, 3 to 15 in.	$2.45	$3.47	$4.27	$3.54	$3.47
Channels, 3 to 15 in.	2.45	3.47	4.27	3.54	3.47
Angles, 3 to 6 in., ¼ in. thick.	2.45	3.47	4.27	3.54	3.47
Tees, 3 in. and larger	2.45	3.47	4.27	3.54	3.47
Plates	2.65	3.67	4.52	3.54	3.67

BAR IRON—Prices in cents per pound at cities named are as follows:

Pittsburgh	Cincinnati	St. Louis	Denver	Birmingham
2.75	3.25	3.44	4.30	3.25

NAILS—Prices per keg from warehouse in cities named:

	Mill Pittsburgh	St. Louis	Denver	Chicago	Birmingham	San Francisco	Dallas
Wire	$3.25	$3.90	$4.90	$3.90	$4.50	$5.25	$5.00
Cut	4.925	5.40	5.61	5.50	....	6.65	6.40

TRACK SUPPLIES—The following prices are base per 100 lb. f.o.b. Pittsburgh for carload lots, together with the warehouse prices at the places named:

	Pittsburgh	Chicago	St. Louis	San Francisco	Birmingham	Denver
Standard railroad spikes ⅝-in. and larger	$3.35	$4.27	$4.44	$5.65	$4.50	$5.05
Track bolts	4.35	5.17	Prem.	6.65	6.00	6.05
Standard section angle bars	2.75	2.75	Prem.	4.60	....	4.40

COLD FINISHED STEEL—Warehouse prices are as follows:

	New York	Chicago	Cleveland	St. Louis
Round shafting or screw stock, per 100 lb. base	$5.00	$4.90	$4.75	$5.00
Flats, squares and hexagons, per 100 lb. base	5.50	5.40	.....	5.50

HORSE AND MULE SHOES—Warehouse prices per 100 lb. in cities named:

	Mill Pittsburgh	Cincinnati	Chicago	St. Louis	Denver	Birmingham
Straight	$5.75	$7.50	$6.50	$7.00	$8.15	$7.00
Assorted	5.85	7.50	6.50-7.00	7.25	8.40	7.25

Cincinnati—Horseshoe nails sell for $4.50 to $5 per 25-lb. box.

CAST-IRON PIPE—The following are prices per net ton for carload lots:

	New York Current	New York One Month Ago	New York One Year Ago	Chicago	St. Louis	San Francisco	Dallas
4 in.	$61.30	$57.30	$70.70	$62.80	$61.00	$82.55	$70.30
6 in. and over	58.30	54.30	67.70	59.80	58.00	79.55	67.30

Gas pipe and 16-ft. lengths are $1 per ton extra.

STEEL RAILS—The following quotations are per ton f.o.b. Pittsburgh and Chicago for carload or larger lots. For less than carload lots 5c. per 100 lb. is charged extra:

	Pittsburgh Current	Pittsburgh One Year Ago	Chicago Current	Chicago One Year Ago
Standard Bessemer rails	$45.00	$55.00	$45.00	$65.00
Standard openhearth rails	47.00	57.00	47.00	67.00
Light rails, 8 to 10 lb.	2.58½*	3.13*	2.585*	3.13½*
Light rails, 12 to 14 lb.	2.54*	3.09*	2.54*	3.09*
Light rails, 25 to 45 lb.	2.45*	3.00*	2.45*	3.00*

* Per 100 lb.

OLD MATERIAL—The prices following are per gross ton paid to dealers and producers in New York. In Chicago and St. Louis the quotations are per net ton and cover delivery at the buyer's works, including freight transfer charges:

	New York	Chicago	St. Louis
No. 1 railroad wrought	$24.00	$23.00	$25.00
Stove plate	17.50	24.00	26.50
No. 1 machinery cast	25.50	29.75	30.00
Machine shop turnings	12.00	10.85	15.50
Cast borings	14.00	11.85	15.00
Railroad malleable cast	16.50	24.00	25.00

COAL BIT STEEL—Warehouse price per pound is as follows:

New York	Cincinnati	Birmingham	St. Louis	Denver
$0.12	$0.16½	$0.18	$0.11	$0.18½

DRILL STEEL—Warehouse price per pound:

	New York	St. Louis	Birmingham	Denver
Solid	14c.	13c.	15c.	15c.
Hollow	18c.	....	....	22c.

PIPE—The following discounts are for carload lots f.o.b. Pittsburgh; basing card of Jan. 1, 1919 for steel pipe and for iron pipe:

BUTT WELD

Inches	Steel Black	Steel Galvanized	Inches	Iron Black	Iron Galvanized
⅛, ¼ and ⅜	50½%	24%	¾ to 1¼	30½%	23½%
½	54½%	40%			
¾ to 3	57½%	44%			

LAP WELD

2	50½%	35%	2	32½%	18½%
2½ to 6	53½%	41%	2½ to 4	34½%	21½%

BUTT WELD, EXTRA STRONG PLAIN ENDS

⅛, ¼ and ⅜	46½%	29%	¾ to 1¼	39½%	24½%
½	51½%	39%			
¾ to 1¼	55½%	43%			

LAP WELD, EXTRA STRONG PLAIN ENDS

2	48½%	37%	2	33½%	20½%
2½ to 4	51½%	40%	2½ to 4	35½%	23½%
4½ to 6	50½%	39%	4½ to 6	34½%	22½%

Stocks discounts in cities named are as follows:

	New York Black	New York Galvanized	Cleveland Black	Cleveland Galvanized	Chicago Black	Chicago Galvanized
⅜ to 3 in. steel butt welded	47%	31%	43½%	34½%	57½%	44%
3½ to 3 in. steel lap welded	42%	27%	45½%	30½%	53½%	41%

Malleable fittings. Class B and C, from New York stock sell at list + 12½%. Cast iron, standard sizes, 10% off.

WIRE ROPE—Discounts from list price on regular grades of bright and galvanized are as follows:

	New York and St. Louis
Galvanized iron rigging	+12½%
Galvanized cast steel rigging	7½%
Bright plain rigging	35%
Bright cast steel	22½%
Bright iron and iron tiller	5%

STEEL SHEETS—The following are the prices in cents per pound from jobbers' warehouse at the cities named:

	Pittsburgh, Mill in Carloads	New York Current	New York One Month Ago	New York One Year Ago	Cleveland Current	Chicago Current
*No. 28 black	4.35	5.50	5.62	6.495	5.27	5.62
*No. 26 black	4.25	5.40	5.52	6.395	5.17	5.52
*Nos. 22 and 24 black	4.20	5.35	5.47	6.345	5.12	5.47
Nos. 18 and 20 black	4.15	5.30	5.42	6.295	5.07	5.42
No. 16 blue annealed	3.75	4.77	4.77	5.695	4.67	4.77
No. 14 blue annealed	3.65	4.67	4.67	5.595	4.57	4.67
No. 10 blue annealed	3.55	4.57	4.57	5.495	4.47	4.57
*No. 28 galvanized	5.70	6.75	7.42	7.745	6.62	6.97
*No. 26 galvanized	5.40	6.45	7.12	7.445	6.32	6.67
No. 24 galvanized	5.25	6.30	6.97	7.295	6.17	6.52

* For painted corrugated sheets add 30c. per 100 lb. for 25 to 28 gages; 25c. for 19 to 24 gages; for galvanized corrugated sheets add 15c., all gages.

SHOP SUPPLIES

NUTS—From warehouse at the places named, on fair size orders, the following amount is deducted from list:

	New York Current	Cleveland Current	Cleveland One Year Ago	Chicago Current	Chicago One Year Ago	St. Louis Current
Hot pressed square	$1.50	$2.25	$1.40	$1.85	$2.00	$2.25
Hot pressed hexagon	1.50	2.25	1.20	1.85	2.00	2.25
Cold punched square	1.50	2.25	.75	1.30	1.30	2.25
Cold punched hexagon	1.50	2.25	.75	1.30	1.30	2.25

CHARLES E. GOLDEN,
President and General Manager.

Worth Many Times Their Cost

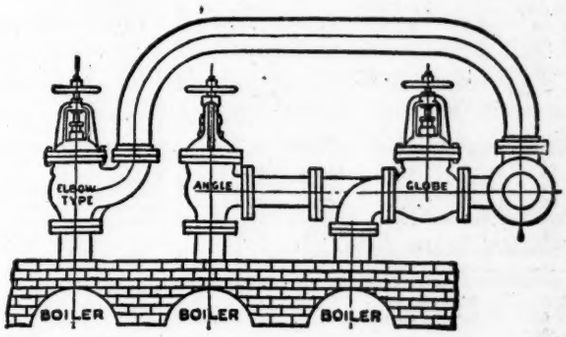
Golden-Anderson Life & Property Insurance Valves

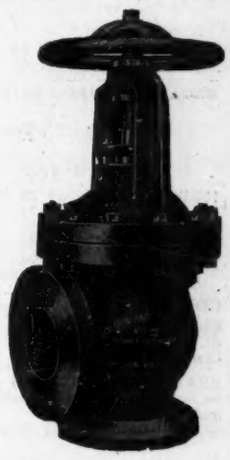
Most boiler accidents happen at times when you can least afford them. Isn't it true?

Any safety device that certainly minimizes your chances of a serious disaster—plant shut-down, or liability due to loss of life—is worth its cost to you many times over.

The Golden-Anderson Life and Property Insurance Valve not only insures you against accidents "when you can least afford them." it insures you against property damage and loss of life, due to a steam pipe or boiler tube break, *at all times.*

1. The only valves which can be tested at any minute while in service.
2. Prevents flow of steam from other boilers to one in which a tube has ruptured.
3. Cut off all boilers when steam main burst.
4. Pressure equalized between boilers automatically.
5. No live steam can enter cold boiler—thus protecting workmen.
6. Fitted with Double Corliss Dash Pot, preventing pounding, chattering and spinning.
7. 1700 in use in U. S. Steel Corp.

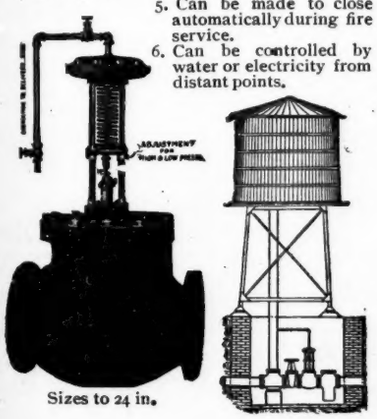




GOLDEN-ANDERSON

Automatic Cushioned Controlling Altitude Valves

1. Eliminate loss of water in reservoirs, standpipes, tanks, etc., by keeping the level constant.
2. Operate without floats or fixtures.
3. Uninterrupted service and a positive water supply assured without danger of water hammer surges or burst mains.
4. No metal to metal seating. Positively cushioned by water and by air.
5. Can be made to close automatically during fire service.
6. Can be controlled by water or electricity from distant points.



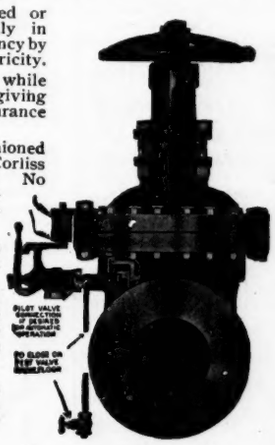
Sizes to 24 in.

"Hosts of References"

GOLDEN-ANDERSON

Double Cushioned Quick Closing Emergency Trip Valves Provide Against Runaway Engines and Disastrous Accidents

1. Give perfect automatic control of the steam or air flow in any pipe line from one or more distant points.
2. Can be opened or closed instantly in case of emergency by steam or electricity.
3. May be tested while in service giving complete assurance of safety.
4. Positively cushioned by double Corliss Dash Pot. No banging, sticking or chattering.
5. Contain no springs or tight fitting parts.
6. Can be adapted for automatic closure in case steam pipe bursts.
7. Double extra heavy and virtually indestructible.

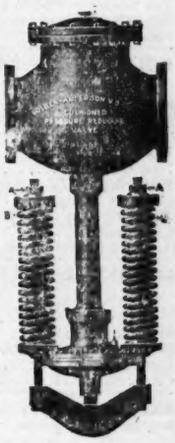


GOLDEN-ANDERSON

Automatic Cushioned Steam Pressure Reducing Valves

Extra Heavy "For High or Low Pressure Service"

1. Automatically keeps the reduced pressure perfectly constant even if the boiler pressure fluctuates.
2. Once adjusted it stays adjusted.
3. Thoroughly cushioned and guided. No pounding, jamming or chattering.
4. A patent safety piston absolutely prevents high pressure steam from penetrating into the low pressure side in case of a broken diaphragm.
5. Double extra heavy and practically indestructible and foolproof.



"Every Valve With an Absolute Guarantee."

GOLDEN-ANDERSON VALVE SPECIALTY COMPANY

1213 FULTON BUILDING, PITTSBURGH, PA.

Semi-finished nuts sell at the following discounts from list price:

	Current	One Year Ago
New York	50—10%	50%
Chicago	50%	50%
Cleveland	60—10%	50%
St. Louis	45%	....

MACHINE BOLTS—Warehouse discounts in the following cities:

	New York	Cleveland	Chicago	St. Louis
½ by 4 in. and smaller	40%	50%	35–5%	50–5%
Larger and longer up to 1 in. by 30 in.	30%	40%	25–5%	40–5%

WASHERS—From warehouses at the places named the following amount is deducted from list price:

For wrought-iron washers:
New York.....$1.25 Cleveland.....$3.75 Chicago.....$3.00

For cast-iron washers the base price per 100 lb. is as follows:
New York.....$7.00 Cleveland.....$3.75 Chicago.....$4.25

RIVETS—The following quotations are allowed for fair sized orders from warehouse:

	New York	Cleveland	Chicago
Steel ⅞ and smaller	50%	55% off	50%
Tinned	50%	55% off	50%

Boiler, ¾, ⅞, 1 in. diameter by 2 in. to 5 in. sell as follows per 100 lb.:
New York..$5.00 base Cleveland..$4.00 Chicago..$4.87 Pittsburgh..$4.72

Structural, same sizes:
New York..$5.10 Cleveland..$4.10 Chicago..$4.97 Pittsburgh..$4.82

CONSTRUCTION MATERIALS

LINSEED OIL—These prices are per gallon:

	New York Current	New York One Year Ago	Cleveland Current	Cleveland One Year Ago	Chicago Current	Chicago One Year Ago
Raw, 5-bbl. lots	$1.80	$1.59	$2.05	$2.10	$2.09	$1.90
5-gal. cans	1.93	1.84	2.25	2.25	2.34	2.00

WHITE AND RED LEAD—Base price.

	Red Current Dry	Red Current In Oil	Red 1 Year Ago Dry	Red 1 Year Ago In Oil	White Current Dry and In Oil	White 1 Year Ago Dry and In Oil
100-lb. keg	14.00	16.10	14.00	14.50	14.00	14.00
25 and 50-lb. kegs.	14.25	15.75	14.25	12.75	14.25	14.25
12½-lb. keg	14.50	16.00	14.50	15.00	14.50	14.50
5-lb. cans	16.00	17.50	.....	.....	16.00	16.00
1-lb. cans	17.00	18.50	.....	.....	17.00	17.00

500 lb. lots less 10% discount. 2000 lb. lots less 10–2½% discount.

COMMON BRICK—The prices per 1000 in cargo or carload lots are as follows:

Chicago.....$12.00 Birmingham.....$15.00
St. Louis, salmon..... 15.00 Denver (hard red)..... 14.00
Cincinnati..... 17.00

PREPARED ROOFINGS—Standard grade rubbered surface, complete with nails and cement, costs per square as follows in New York, St. Louis, Chicago and San Francisco.

	1-Ply C.l.	1-Ply L.c.l.	2-Ply C.l.	2-Ply L.c.l.	3-Ply C.l.	3-Ply L.c.l.
No. 1 grade	$1.50	$1.75	$1.90	$2.15	$2.30	$2.55
No. 2 grade	1.35	1.60	1.70	1.95	2.05	2.30

Asbestos asphalt saturated felt (14 lb. per square) costs $5.00 per 100 lb.

Slate-surfaced roofing (red and green) in rolls of 108 sq.ft. costs $2.25 per roll in carload lots and $2.50 for smaller quantities.

Shingles, red and green slate finish cost $6.00 per square in carloads, $6.25 in smaller quantities, in Philadelphia.

ROOFING MATERIAL—Prices per ton f. o. b. New York and Chicago:

	Carload Lots N. Y.	Carload Lots Chicago	Less Than Carload Lots N. Y.	Less Than Carload Lots Chicago
Tar felt (14 lb. per square of 100 sq.ft.)	$70.00	$70.00	$71.00	$71.00
Tar pitch (in 400-lb. bbl.)	21.00	18.00	22.00	19.00
Asphalt pitch (in barrels)	34.00	34.00	37.50	37.50
Asphalt felt	68.00	68.00	72.50	72.50

HOLLOW TILE—Price per block in carload lots for hollow building tile:

	4x12x12	8x12x12	12x12x12
St. Paul	$0.087	$0.135	$0.185
St. Louis	.10	.18½	.31
Seattle	.09	.175	.30
Los Angeles*	.082	.154	.236
New Orleans	.165	.22	.325
Pittsburgh	.065	.115	.....
Chicago	.08	.144	.....
Denver	.125	.18	.25
Cincinnati	.08705	.1623	.2416

*F. o. b. factory, 4, 8 and 10 inch.

LUMBER—Price of pine per M in carload lots:

	1-In. Rough 10 In. x 16 Ft.	2-In. T. and G. 10 In. x 16 Ft.	8 x 8 In. x 20 Ft.
St. Louis	$49.00	$45.00	$41.00
Birmingham	40.00	48.00	43.00
Denver	43.25	35.00	43.00
Cincinnati	50.00	50.00	50.00

EXPLOSIVES—Price per pound of dynamite in small lots and price per 25-lb. keg for black powder:

	Low Freezing 20%	Gelatin 40%	Gelatin 60%	Gelatin 80%	Black Powder
New York	.....	$0.27½	$0.30	.....	$2.40
Boston	$0.22½	.24½	.26½	$0.31	2.20
Kansas City	.18½	.22½	.25½	.29	2.45
New Orleans	.23½ (50%)	.22½	.24½	.....	.....
Seattle	.13½	.18	.20½	.24½	1.70
Chicago	.18½	.20½	.25	.29½	2.15
St. Paul	.18½	.22½	.25½	.....	2.25
St. Louis	.18½	.22½	.23½	.29½	1.80
Denver	.17½	.21½	.24	.28½	2.25
Los Angeles	.25	.30	.35	.27½	3.00

MISCELLANEOUS

GREASES—Prices are as follows in the following cities in cents per pound for barrel lots:

	Cincinnati	St. Louis	Birmingham	Denver
Cup	7–8	3.6–3.7	8½	13½
Fiber or sponge	7	7.2	9	18
Transmission	9–10	13	8½	15
Axle	5	4½	4½	5½
Gear	5	6½	8½	8
Car journal	5	4.7	4½	15½

BABBITT METAL—Warehouse prices in cents per pound:

	New York Current	New York One Year Ago	Cleveland Current	Cleveland One Year Ago	Chicago Current	Chicago One Year Ago
Best grade	90.00	90.00	80.00	80.00	75.00	75.00
Commercial	50.00	45.00	18.50	23.00	15.00	75.00

HOSE—Following are prices of various classes of hose:

Fire: 50-Ft. Lengths
Underwriters' 2½-in. 75c. per ft.
Common, 2½-in. 35%

Air

First Grade	Second Grade	Third Grade
¾-in. per ft. $0.55	$0.40	$0.25

Steam—Discounts from list

First grade	30%	Second grade	40%	Third grade	40%

LEATHER BELTING—Present discounts from list in cities named:

	Medium Grade	Heavy Grade
St. Louis	30%	35%
Denver	10%	5%
Birmingham	30%	35%
Chicago	45%	35%
Cincinnati	25%	20%

RAWHIDE LACING—20% for cut; 45c. per sq.ft. for ordinary.

PACKING—Prices per pound:

Rubber and duck for low-pressure steam	$0.90
Asbestos for high-pressure steam	1.50
Duck and rubber for piston packing	1.00
Flax, regular	1.20
Flax, waterproofed	1.60
Compressed asbestos sheet	.90
Wire insertion asbestos sheet	1.10
Rubber sheet	.50
Rubber sheet, wire insertion	.70
Rubber sheet, duck insertion	.50
Rubber sheet, cloth insertion	.30
Asbestos packing, twisted or braided, and graphited, for valve stems and stuffing boxes	1.20
Asbestos wick, ½- and 1-lb. balls	.85

MANILA ROPE—For rope smaller than ⅜-in. the price is ½ to 2c. extra: while for quantities amounting to less than 600 ft. there is an extra charge of 1c. The number of feet per pound for the various sizes is as follows: ⅜-in., 8 ft.; ½-in., 6; ⅝-in., 4½; 1 in., 3½; 1 1/16-in., 2 ft. 10 in.; 1¼-in., 2 ft. 4 in. Following is price per pound for ⅜-in. and larger, in 1200-ft. coils:

Boston	$0.27½	Atlanta	$0.29½
New York	.27	Denver	.27½
St. Louis	.24½	Kansas City	.26½
Chicago	.26½	New Orleans	.25½
St. Paul	.26	Seattle	.25
San Francisco	.24	Los Angeles	.28

PIPE AND BOILER COVERING—Below are discounts and part of standard lists:

PIPE COVERING Pipe Size	Standard List Per Lin.Ft.	BLOCKS AND SHEETS Thickness	Price per Sq.Ft.
1-in.	$0.27	½-in.	$0.27
2-in.	.36	1 -in.	.30
3-in.	.45	1½-in.	.45
4-in.	.60	2 -in.	.60
6-in.	.80	2½-in.	.75
8-in.	1.10	3 -in.	.90
10-in.	1.30	3½-in.	1.05
85% magnesia high pressure			List
For low-pressure heating and return lines		4-ply	58% off
		3-ply	60% off
		2-ply	62% off

WIRING SUPPLIES—New York prices for tape and solder are as follows:

Friction tape, ⅙-lb. rolls	48c. per lb.
Rubber tape, ½-lb. rolls	60c. per lb.
Wire solder, 50-lb. spools	46c. per lb.
Soldering paste, 2-oz. cans	$1.20 per doz.

COPPER WIRE—Prices per 1000 ft. for rubber-covered wire in following cities:

	Denver Single Braid	Denver Double Braid	Denver Duplex	Birmingham Single Braid
14	$14.50	$17.50	$35.00	$ 12.50 Solid
10	23.25	29.25	58.75	25.10 "
8	31.05	38.30	77.95	34.75 "
6	50.60	52.65	.....	57.50 "
4	73.00	75.32	.....	81.65 "
2	110.00	112.45	.....	140.20 Stranded
1	143.90	146.15	.....	190.90 "
0	181.25	181.25	.....	231.33 "
00	.....	.....	.....	281.83 "
000	.....	.....	.....	343.22 "
0000	.....	.....	.....	416.80

Pittsburg—23c. base; discount 50%; St. Louis—30c. base.

FREIGHT RATES—On finished steel products in the Pittsburgh district including plates, structural shapes, merchant steel, bars, pipe fittings, plain and galvanized wire nails, rivets, spikes, bolts, flat sheets (except planished), chains, etc. the following freight rates per 1000 lb. are effective:

Boston	$0.30	New Orleans	$0.38½
Buffalo	.17	New York	.27
Chicago	.27	Philadelphia	.24½
Cincinnati	.23	St. Louis	.24
Cleveland	.17	St. Paul	.49½
Denver	.99	Pacific Coast (all rail)	1.25*
Kansas City	.59		

Note—Add 3% transportation tax. Minimum carload, 80,000 lb.